Forestry

JAN 15 1930

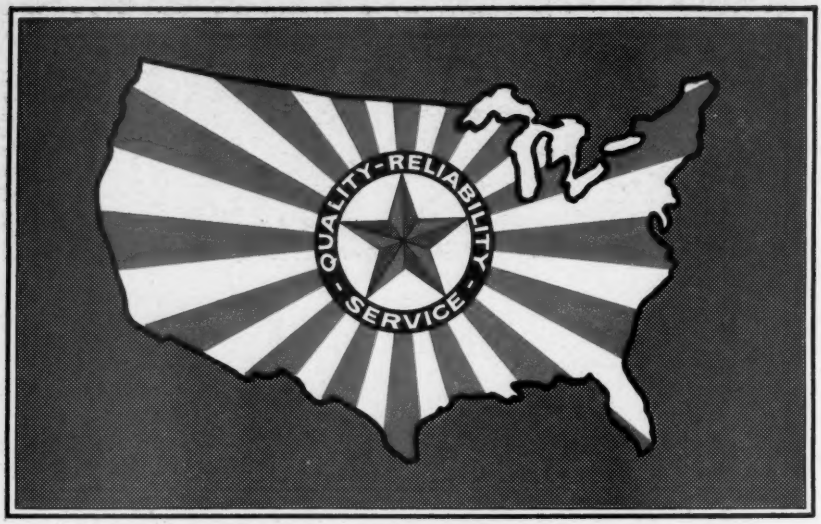
VETERINARY MEDICINE

September, 1929

Editorial Paragraphs 361-365
The Business Side of Practice 366
Fish Meal and Cod Liver Meal 370
Tetanus in a Mule Colt Three Weeks Old 374
A Record in Tuberculin Testing 375
Vaccinating Dogs Against Rabies 375
1,000 "Family Cows" React to Tuberculin 375
Results of Prophylaxis Against Rabies in Italy 375
Wild Tobaccos as Stock Poisoning Plants 376
Black Locust Poisoning 377
Riding Horses for the Military Service 378
"Worm Expellers" Must Be Labeled Correctly 378
Tetrachlorethylene Effective Against Sheep Parasites 379
The Control of Anthrax in the South 380
Milk Borne Diseases Dying Off 383
Tuberculosis of the Testicles with Metastasis 384
Antiphlogistine in Abdominal Injury 384
Arecolin Hydrobromid—Its Uses in General Practice 385
Broom Handle Removed from Esophagus of Cow 386
Pemphigus in a Cow 387
Manufacturers of Dog Medicines Warned 388
A Perfect Score for a Biological Preparation 388
Roup and Parasitisms of Fowls 389
Eradication of Pullorum Disease 390
Diseases of Poultry—Recognition, Treatment and Prevention 392
Infected Milk Causes Epidemic 400
Coccidiosis in Rabbits 400
Black Tongue—Canine Typhus 401
Fright Disease 403
Meeting Reports, News, Etc 404

No. 9
VOL. XXIV

180 N. Michigan Ave.
Chicago, U. S. A.



A NATION-WIDE SERVICE TO THE VETERINARIAN

ONE nation-wide standard of intimate, personal service to the Veterinary profession stands back of the Fort Dodge trademark on the biologics and pharmaceutics which you use.

A network of Fort Dodge branches and service offices stretches from coast to coast. Wherever you are engaged in practice, Fort Dodge is closeby, with both products and service of unfailing reliability.

"A nationwide institution dedicated exclusively to the service of the Veterinary profession."

FORT DODGE

SERUM COMPANY

Veterinary Biologics and Pharmaceutics. U. S. Veterinary Licence No. 112.

FORT DODGE, IOWA

Veterinary Medicine

VOL. XXIV SEPTEMBER, 1929 No. 9

Published Monthly by the Veterinary Magazine Corporation
180 N. Michigan Ave., Chicago, Ill., U. S. A.
$4.00 a Year

Entered as second-class matter November 8, 1920, at the post office at Chicago, Illinois, under the Act of March 3, 1879.

Entered as second-class matter under the title of American Journal of Veterinary Medicine, July 19, 1910, at Chicago, Illinois, under Act of March 3, 1879.

Copyrighted 1928, by Veterinary Magazine Corporation.
All matter appearing in this publication is covered by copyright, and no part of it may be reproduced without permission. Permission will be granted on request for the reproduction of anything in the columns of VETERINARY MEDICINE if the purpose of the reproduction is unobjectionable. Where there is any doubt as to the propriety of reproduction, the wishes of the author will be consulted.

D. M. Campbell, Editor A. T. Kinsley, Associate Editor

R. S. Cameron, Tryon, Prince Edward Island, reports that it is the custom of the farmers and cattle breeders in his section to feed cows having retained placenta a bran mash to which has been added 40 minims of liquified phenol. The mash is fed once daily, and in four days or less the placenta comes away entire—so the farmers say.

The house fly, *Musca domestica,* is a pest of considerable importance. It has been calculated that two millions of dollars are spent annually for fly paper and ten million for screening; fifty million for the handling of tubercular patients attributable to infection spread by these pests; seventy million for the care of typhoid patients traceable directly or indirectly to infection by flies, another thirty million dollars expended in the care of intestinal disorders and dysentery cases of fly origin. This expenditure and the untold suffering incident to disease could be largely avoided by simple sanitary measures. The fly breeds in filth and principally in horse manure. The proper disposal of horse manure or treatment of manure heaps will reduce the number of house flies very materially. Borax and hellebore have been found to be quite effective in destroying the fly larvae in manure. One pound of borax to 16 sq. ft. of manure and one pound of powdered hellebore to 20 sq. ft. of manure destroy about 90% of the larvae. Veterinarians can be of service in giving advice relative to the control of house flies.

Cod liver oil deteriorates when exposed to air and light. Such exposure decreases the vitamin D potency. Hence stock containers of cod liver oil should be protected against air and light. Perhaps the failure to obtain results anticipated from the administration has been due to the use of a deteriorated product.

Arsenical poisoning is relatively common in live stock. Arsenic may be ingested in food or water or it may occur in animals as a result of dipping and absorption through the skin. Colicky pains, thirst and diarrhea are the outstanding symptoms of arsenical poisoning, and the lesions in these cases consist of hemorrhages, congestion, inflammation and erosion in varying degrees in the digestive mucosa.

There are three reasons why nanny goats refuse to own their kids, the first being poor in flesh and producing little or no milk; second, being forced to kid in a crowded pen and third, rough handling. To prevent non-ownership, nannies should be kept in fair condition and provided comfortable ample space for kidding. Some goat men claim that it is necessary to keep a nanny and her kid in confinement for 36 hours to insure the nanny mothering the kid. A nanny can be made to adopt a kid by confining the nanny and the kid in a small well bedded pen although it may be necessary to tie the nanny for the first sucking.

The cause of infectious keratitis (pink eye) in cattle has not been identified. Bright light and especially sunlight intensifies the disease, therefore affected animals should, if possible, be kept in sheds or barns. Mild antiseptic washes and protoiodid of mercury ointment topically applied are of value.

The wooly pod milkweed *Asclepias eriocarpa,* has been found to be quite poisonous for sheep and other animals. It is usually not consumed if any other forage is available. The plant is especially prevalent in California. Cattle and sheep are subject to the poison. The lethal dose varies from 0.1 to 0.2 pounds of the plant to the hundred pounds of animal.

The occurrence of tuberculosis in snakes has been reported by J. D. Aronson of the Henry Phipps Institute, University of Pennsylvania. Four garter snakes died in the Philadelphia zoological garden in 1927-28. Tubercles were found in various organs of the four snakes and acid fast but not alcohol fast microorganisms were identified. These microbes were pathogenic for garter snakes, frogs, gold fish and lizards but not for guinea pigs, rabbits, chickens or pigeons. Thus, tuberculosis of the snake is apparently not transmissible to warm blooded animals and is of importance only in Zoological gardens.

It is sometimes difficult to distinguish between deficiency disorders and vicious habits. Do hogs kill and eat chickens as a result of deficiency in the supplied food or because of habit? Some few swine breeders have reported that the feeding of a ration containing vitamins and minerals will apparently prevent chicken eating. If chicken eating is primarily a deficiency disorder affcted hogs should be cured by providing a proper ration. It is generally conceded that vitamins and minerals are of very great value in correcting certain disorders but common sense implies that such products are not indicated as a cure in all diseases and disorders, neither does it appear rational that either vitamins or minerals separately or combined can be recommended as a preventive or cure for vicious habits.

Rose chafers, *Cetomia aurata,* or the rose beetle, are extremely poisonous when devoured by chickens. It is said that only a few of these beetles are necessary to cause death. The symptoms manifested consist of drowsiness, leg weakness, the head and neck are retracted over the back and sharp cries are frequently emitted from the affected bird.

The loss of live stock due to poisonous plants is an important economic question. It has been estimated that the losses in Colorado from poisonous plants exceeds one million dollars annually. The sheep industry of Wyoming loses approximately 15% of their sheep annually from this cause. From all available information, it has been calculated that the average annual loss to the live stock industry in the range states is from three to five per cent of the value of the live stock.

Chlorin has been found to be of value in relieving acute congestion of the mucosa of the respiratory passages in the human. It is reasonable to assume that similar results may be obtained in the relief of the same condition in lower animals. Will it be possible for transportation companies to arrange a system of chlorinating animals in transit and prevent the coryza and other conditions caused by inhalation of cold air and irritating gases and foreign bodies incident to shipment. The future of medicine no man can foretell.

It is now almost universally conceded that a variety of mineral substances are required in the diet of farm animals to build up the normal tissues, repair waste and to serve in metabolic processes. The grains and hay grown on some soils possess sufficient minerals to supply the normal demands, but some soils are deficient in certain mineral elements and feeds grown upon such soils should be supplemented by the proper minerals. The use of a composite mineral supplement where only one or two minerals are required is not good practice and indicates failure in specific diagnosis.

Hydrogen sulphid when in sufficient concentration, is one of the most toxic of gases. The rapidity of the toxic effect of hydrogen sulphid is comparable to that of hydrogen cyanid. The exact mechanism of hydrogen sulphid poisoning has not been determined.

According to some authorities fowls are more sensitive to lead than any other animals. They are readily poisoned with practically any lead salt. One of the first symptoms of lead poisoning is the production of soft shell or shelless eggs.

Bacterium coli is capable of producing a diseased condition in fowls that may be difficult to differentiate from fowl cholera. This infection usually occurs in fowls that have had their resistance diminished by insanitary surroundings, improper feed or water, and by undue exposure.

A method has been devised for the detection of goat's milk when admixed with cow's milk. The test is made by adding 2 cc. of a 25% solution of ammonium hydroxid solution to 20 cc. of the skimmed milk, heating at from 50 to 60 deg. C. for thirty minutes and then centrifuging. A precipitate indicates the presence of goat's milk.

The principal difference between dairy cows and beef cows, according to Swett, Graves and Miller, is due to extreme development of the udder in the dairy cow and fleshing in the beef cow. There is very little difference in the skeletons of the two types. The evolution of these two types of cattle has been accomplished by selection and breeding.

According to Strauss, fertility, in the white rat is in some way dependent upon either the seminal vesicles or the prostates or at least white rats from which these structures were removed were sterile. No doubt these structures have an important function in other animals and some cases of sterility in stallions, bulls, boars and rams may be due to disease of seminal vesicles and prostates.

Coccidial infestation in young chickens can be differentiated from bacillary white diarrhea by the fact that the yolk is unabsorbed in the latter.

Blueberries appear to have some detrimental action on intestinal parasites in children especially the oxyuris; at least Nyberg found that children infested with oxyuris, were relieved of those parasites by consuming quantities of blueberries.

It is difficult to raise orphan pigs unless they can be kept at a temperature of about 70 deg. F. and provided with a proper diet. Exposure to drafts of cold air is a common predisposing cause of digestive disturbance that may terminate in a fatal attack of scours.

Regeneration of liver tissue occurs, according to recent investigations. This regeneration is relatively rapid, for it is claimed that 60 to 70% of liver tissue will be regenerated in six to eight weeks. This opens a new field for surgery and the possible saving of hundreds of lives of individuals in which there is disease of a portion of the liver.

The demand for calf liver because of its value in the correction of anemia has resulted in some investigation relative to the vitamin, nitrogen and mineral content of liver from different animals. It has been found that there is a variation in composition even in liver from the same species of animals. However, lamb liver can be substituted for calf liver.

The occurrence of goitre in pigs has recently been reported from various sections. Several farmers have lost heavily of their spring farrow from this malady. Goitre is the easiest and simplest of all known deficiency diseases to prevent. The administration of iodin to the sow during the period of pregnancy prevents the occurrence of goitre in pigs. This treatment is inexpensive as the dosage required is relatively small and it may be administered in the feed.

It requires about five pounds of feed to produce one pound of eggs, a ratio that compares favorably to the conversion of feed into pork.

Mohair is a relatively recent name; however the value of the clip from goats has been recognized for centuries. Thus King Solomon used mohair for the curtains in his temple at Jerusalem.

Colorado sunshine has been found to be highly efficient in the prevention and cure of rickets. It has been noted that rickets is relatively rare in that state and it is apparently due to the fact that a large amount of ultra-violet rays of light is permitted to pass through the rare, dry atmosphere.

"Hoof balls" is a term used to designate an accumulation of soil entangled with fleece, straw, hay, etc., that adheres to the toes. Such balls are relatively common in goats kept in lots that are not properly drained. "Hoof balls" vary from three to four inches in diameter and will weigh from four to six ounces. They interfere with locomotion and predispose to foot rot. They are easily removed.

Market demand for guinea fowls is increasing because the American people are beginning to appreciate the fact that the flesh of the guinea is very similar to that of wild fowls. The guinea fowl is subject to about the same diseases as other barn yard fowls. They do not thrive unless they have considerable range and they prefer to roost in trees although they can be trained to roost in a hen house.

An imitation silk has been made from the glue obtained by processing swine ears. This imitation silk produced from glue is so similar to the genuine that experts are required to detect the difference between silk derived from worms and glue. The adage, "you can't make a silk purse of a sow's ear" must be relegated to days gone by. Popularizing this fact should increase the respect for swine.

Proper handling of the colt from the time that it is a few days of age will prevent any difficulty when the time comes for haltering, tieing and breaking. Kindness and patience are quite essential in breaking and training colts.

The successful production of swine is dependent upon providing of sanitary quarters for these animals. Profitable hog raising does not require the construction of expensive permanent hog houses. Simple, inexpensive shelter and equipment suffice.

The production of food stuff containing the proper balance of the essential ingredients including vitamins and mineral elements, is becoming more difficult because of depletion of the soil. Deficiency diseases will increase unless more effective efforts are resorted to in replenishing soils.

An interesting case of Bovine leukemia was reported by Creech and Bunyea in the Journal of Agricultural Research. These authors confirm the findings of previous investigators in that the cause of bovine leukemia is unknown. They also demonstrated that the disease is not transmissible by blood or glandular material.

The sweat glands were formerly considered an auxiliary of the kidneys. More recently, it has been shown that the sweat glands eliminate a fluid that contains small quantities of salts and therefore evaporates rapidly, whereas urine contains salts in varied proportions. The chief function of the sweat glands is elimination and evaporation of fluid, thus regulating body temperature, and the chief function of the kidneys is elimination of salts and the end products of katabolism of nitrogenous compounds. The only compensatory function of kidneys and sweat glands is in elimination of water. Sudorifics may therefore be used to lower body temperature under certain conditions, but not to compensate for an impaired kidney function.

The prevalence of hog cholera later will depend largely upon the amount of immunization done to protect the spring pigs.—U. G. Houck.

Medical discoveries do not come by chance. Each forward step is the result of long and painstaking study and experimentation, by highly skilled men. Such researches cost a great deal of money—but they are worth it!— *Clinical Med.*

The inspiring thing about work in the field of science is that every bit of new knowledge becomes from the moment of its discovery the heritage of all future ages, enabling coming man, as long as mankind endures, to live just so much more wisely than past man has known how to live.—*Science.*

In a series of transmission experiments *Trypanosoma evansi,* by the *Tabanus rubidus* it was found that it was sufficient to allow the fly to suck for five seconds only to obtain or transmit the trypanosome. Viable trypanosomes persisted for several hours in the fly. Thus the rapid spread of surra is affected and the necessity for the control or eradication of the tabanus in the control of surra is evident. —*Trop. Vet. Bul.*

The hatchability of fertilized eggs is diminished, the percentage of infertile eggs is increased and fewer and smaller eggs are produced from hens fed a ration of yellow corn, wheat and buttermilk in the absence of a calcium carbonate mineral supplement.—Kentucky Experiment Station Bul. No. 291.

According to U. F. Richardson, antimony potassium tartrate is of considerable value in the control of a disease in cattle caused by the *Trypanosoma gongolense.* The treatment consisted of the intravenous injection of 15 grains of the antimony potassium tartrate in 25cc of distilled water. This dosage is repeated for four successive days.—*Trop. Vet. Bul.*

The use of the live culture abortion vaccine in cattle during the early stages of pregnancy is a safe procedure according to Zwick.—*Exp. Stat. Rec.,* Vol. 52, No. 8.

Fish are subject to rickets according to Thompson of the Illinois National History Survey. This malady in fish is apparently a vitamin deficiency. The condition has been observed in carp from the Illinois river. Affected fish have a small, deformed head and are called "knotheads."—*Science.*

The occurrence of small quantities, even traces of certain inorganic constituents, such as copper and zinc, in cow's milk has been common knowledge. Recent investigations indicate that these inorganic constituents are of value and may be essential for normal development in the new born.—*Science.*

Tubercle bacilli are not eliminated through normal renal epithelium in experimental guinea pigs, according to Spitzer and Williams. Some laboratories have reported the finding of tubercle bacilli in the urine of pulmonary tubercular patients—they may have found only the smegma bacillus.—*Bio. Abst.*

By a study of statistics it can be shown that sun spots have an influence on the numbers of animals born. Thus the Hudson Bay Company has maintained records since 1845 that show an increase in the number of rabbits, foxes and lynx every eleven years. The years when there was the largest number of those animals, there were fewest sun spots.—*Science.*

Cancer of the mammae has been noted to occur in about 90% of the females of a certain strain of mice. No occurrence of this type of cancer has been observed in the male mice of this same strain. However, in nearly 20% of castrated males into which had been grafted an ovary, this type of cancer developed. This indicates that ovarian secretion is a factor in the occurrence of this type of tumor.

The Business Side of Practice

By E. T. BAKER, Moscow, Idaho

THOSE of us who have been in practice the past fifteen years or so have seen some wonderful changes in the agricultural world. We have been through a terrific inflation, and we have felt the effects of the inevitable result. We have seen the tractor displace the draft horse in many places, and the auto supplant the driving animal. However, as we look around at other trades and professions, those of us who saved money while the saving was good, find ourselves just as well off as the average tax-payer.

You probably know of the rancher who saved $20,000 the past ten years. He said his wife had taught school and saved $500, while his uncle had died and left him $19,500.

Veterinarians in the West, perhaps, see more of a shifting population than in the more settled regions of the middle west or east. About sixteen years ago there was a regular hegira (what ever that means) from this part of the country to Montana and Canada. Prosperous ranchers, attracted by the low price of virgin soil, sold their farms and emigrated to these newly settled regions. In less than three years we had inspected over two hundred carloads of emigrant stock. But the dry years came on, interspersed with early and heavy frosts, and over 90% of these hard working ranchers lost everything they had.

There is evidently something wrong with agriculture. The general cry among ranchers in my community is not for political intervention or protection. All they want is a lower price on the commodities they buy and lower taxes. Another class hit mighty hard was the world war veteran who started in farming just as the deflation was beginning. Unless he was well backed, he lost all he had. A grateful nation then gave him the whole country to start all over again.

In our state, over sixty banks went "flooey" in less than a year. Sheepmen were caught in the jam, and went broke by the hundreds. Cattle men hung on by their eye lashes for years. The only line of agricultural activity that never wavered was the dairy industry, and that was a life saver for many veterinarians. With more and more interference from county agents, salaried state and college officials, patent medicine vendors, and agricultural graduates with just enough veterinary training to make quacks out of them, added to a general financial constipation among his farmer clients, it behooves the regular graduate practitioner to sit down and think things over.

It has been said the only thing that does not change is progress. The utility of last year is obsolete the next. The ice man is now selling electric refrigerators, and the phonograph salesman is now demonstrating radios. We smile when we think of the milk fever treatment of thirty years ago, but what will the veterinarian of 1959 think of some of our present day therapeutics?

Equipment

As practice is nothing more or less than a business, we must be prepared to take care of it. No cut and dried specific rules can be laid down, for what applies to one individual may be worthless to another.

1. Health: It may seem strange to place this first of all. But what is more essential? We lead an active life. We require a lot of muscle in everyday practice. We have irregular hours. Our clients are not interested in our physical ailments, any more than we care to listen to their long drawn-out squawks about "rheumatiz" and other kindred aches or pains. When the writer was a boy, thirty years ago, being "delicate" was a high honor. Death from a long drawn-out

case of pulmonary tuberculosis was considered the "little Eva" method of going to heaven. One was considered rough and uncouth to be healthy. Hours were consumed in comparing symptoms, and an operation was a trump card that bestowed distinction upon its fortunate owner throughout a long and heavy eating life. Nowadays, Grandpa whangs the little golf ball, while Grandma uses the same rouge as her flapper grand daughter, and both are highly insulted if you intimate how feeble they look. In other words, health is the fashion.

2. Personality is a close second, and adaptability falls under this head. Not all people like us. We take a violent dislike to persons who are not even acquainted with us. Later on, we may find these people to be very congenial. The easiest way to get along is to be yourself.

3. Education may be placed next. We often wonder what is meant by education. It is a baffling term. It usually takes about five years to live down a college course, and about the time one gets the hump out of his back from wearing fraternity pins, he loads up on lodge regalia. Mother Experience usually gives a few postgraduate credits.

4. Location is a vital question, for unless the stock owners are numerous enough and able to pay for services, the practitioner is like an auto without gas. Another thing, several or more veterinarians are located in one community, and by dividing the business, only eke out a bare existence.

5. Last, but not least, is the car, drugs, supplies and home or hospital. A medicine room is indispensable. If one is fortunate enough to live near the center of town he can get along without the expense of renting an office. Overhead has ruined many a man, and cutting expenses is just as important as making money.

6. Fees and collections are the heart of practice. Unless the income exceeds the outgo, the business is not very remunerative.

7. Thrift and saving, we are sorry to say, is not as common as it should be. When we were just out of college, we had a position for several years travelling around over the country. We came into contact with nearly all the practitioners in this part of the west. Practically all were making good money, but only a very few were "salting" down any. Some were kept poor paying Irish dividends on mining or oil stocks. Others were emulating the sultan of Turkey in trying to maintain a harem. Poker, booze, slow horses and fast women, extravagant habits, and neglect of business all were working havoc with many otherwise good men. Speculation in land, stock ranches, dabbling in too many outside interests kept others poverty-stricken. A few were saving money, and living the simple life. When their community was hit with hard financial times, they weathered the storm in good shape. They had remembered practice may be good one year and poor the next.

8. Lodge or club affiliations is an important item. We believe membership in a good lodge or two is beneficial for any one. In a small community it is a great asset in the social life. It helps one to get acquainted. However, jumping into everything is a mistake. It is estimated over half a million members of various lodges, clubs and other organizations dropped out last year. Better take out a life membership, if at all possible, in your earning prime, in one or two organizations, and put the rest of your spare change in life insurance policies.

9. Dispensing, buying and prescribing is an important adjunct in a successful practice. We dispense some, prescribe some and keep our pet formulae to ourself. We have found that whole neighborhoods use the same prescription, and many a practitioner who wonders where the practice is, can lay a lot of the blame right to this cause. When a rancher gets in the habit of coming to you for emergency medicines, you can tell him that if the patient does not improve in a few

hours, better call up. This leads to a lot of business both profitable to you and your client, for, given half a show, the patient will recover. We stick to the old tried and true standbys of the materia medica. We like to pay cash for all our supplies. We purchase our drugs, etc., from the local drug stores, and the specialties from the supply houses, who give us the best of service. We like to clean up all our supplies each year, so that we can keep a fresh, active assortment for use in practice.

10. We learn through experience, there are not so many puzzling maladies as we may have thought there were. When several calves die suddenly we think of blackleg. When a fresh cow cannot get up, milk fever is the usual cause. When a horse stands around in winter looking like a rancher who has just received his tax statement, we suspect impaction. If a bunch of hogs suddenly cease living, we thing of cholera. If we receive a call early Monday morning to see a horse that "is sickern 'ell an' all sweatin'" it does not take a magician to think of azoturia. Distemper is the common ailment of young dogs, and round worms the constant parasite that is found everywhere. Of course, we run across the atypical, the uncommon, and the out of the way diseases that only an autopsy or bacteriological report can help solve. It is no discredit to anyone to run up against something he is not sure of. The general practitioner cannot be a wizard at everything. In other words, know your limitations, and then, if you do not take yourself too seriously, you may get by. Personally, the writer has always liked diagnosing obscure outbreaks better than any other part of practice; obstetrical work comes second, and surgery last.

11. The age, breed, type, sex, and condition of the patient should always be carefully considered. For example, strychnin to Jersey cows or turpentine to stallions should be given cautiously. Ewes within a month of parturition should not be given vermifuges or too strong mineral mixtures. Some diseases recover quickly, while others take their own sweet time, and cannot be hurried.

12. Expense of medication should be taken into consideration. In rare cases, only certain agents are indicated, and must be used regardless of expense. The best of anything is usually the cheapest in the end, so do not stint on good grips, instruments, biologics, drugs or other supplies. Then keep them in good working order. We always carry along several of the everyday instruments, such as hypodermic syringes, milk fever outfits and trocars. If you ever get caught out in the country, ten miles from home, on a dark night, with muddy roads, and your last hypo needle breaks; your only trocar sticks; or your lone milk fever pump "busts" you will realize what is meant.

13. Neat stationery; a typewriter; a good desk, and a knowledge of bookkeeping does no harm to a practitioner. A six-point Gothic type on good parchment or bond paper will make a fine looking letter-head, envelope, statement, label or other personal stationery. When writing letters, make a carbon copy and file it away at the end of each month. A working knowledge of photography is useful. Snapshots can be filed in a library kodak album, and negative albums are handy. A knowledge of public speaking is a valuable possession, for one is judged largely by what he can make people think he knows rather than by erudite intellect.

14. There are a number of helpful wrinkles and short-cuts one picks up in everyday work. The use of wax dilators after inflation; drenching a cow or giving a capsule to a horse without the animal struggling; throwing a colt with the aid of one man, and so on. Taking no chances with any animal, sick, dead, quiet or wild always pays. Getting familiar with a sick dog that may have the first stage of rabies is just as foolish as picking up the hind foot of a peevish mule.

15. There are so many different

branches of our profession, that we may pull against each other, instead of working together. The man in meat inspection soon loses track of therapeutics. The college research worker is more interested in laboratory technic. The federal or state official bends his energies to contagious disease eradication. The serum producer or biologic worker specializes in this industry, while the general practitioner is kept busy keeping track of the latest advances in therapy. As long as each one attends to his own particular field, very little friction occurs. More trouble has occurred within our own ranks than from the outside. The public or stock owner is no more interested in our squabbles than we are in a fight within the plumbers union. Political feuds, cliques, professional jealousy and general all around "cussedness" keep a lot of strife going. Happy is the practitioner who is financially able to tell all interfering agencies to go jump in the "crick." We bring very little into this world, and we take just as much out, and, as we pass this way but once, why struggle to amass more than a competence? About two weeks after our estates have been probated we are forgotten. Why not try and get as much pleasure out of life as possible, and extend a helping hand whenever we can? Very few know the tragedies and comedies of rural life as does the country practitioner.

17. Veterinary associations and conventions still occupy an important place in our activities. The old fashioned idea of long-winded discussions is being thrown in the discard rapidly. What the average man wants, who leaves his practice for a few days, is something snappy, helpful, and time enough to meet other fellow practitioners or old friends he has not seen for years. What does the average veterinarian care for the intricate surgical operation that may not be met with in a life time? For example, we spent one whole forenoon watching an expert amputate the udder of a cow. He had more hemostats in action than an army hospital. It was a very clever operation, and it was due to no fault of his that the cow was dead within three hours. We have answered over twenty thousands calls, but we have never been asked to perform that operation. We would have been far more interested in watching some simple, everyday operation, such as removing a teat tumor, relieving a hard milker, or demonstrating epidural anesthesia.

18. Our literature is full of lengthy articles or technical discussions that pass right over the practitioner. Not that he cannot understand them, but it is merely out of his line. One great and noble authority claims the bacillus of Bang has blue eyes, while another equally learned scientist says its eyes are brown. About this time a still more noted savant claims the bacillus wears specs, so what is a person to think? Another carefully written thesis takes up thirty pages of valuable space in comparing the urea content of a guinea pig suffering with the pip. Now this may be important to some and interesting to a few, but why burden current literature with such elaborate formulae?

Success or failure in practice, therefore, depends on a number of factors. First, it may be the man himself; second, it may due to causes beyond human control, and third, location, good fortune and general conditions.

We often become dissatisfied with our surroundings and lot in life. However, it takes all kinds of people to make a world, from the contented person who never leaves his native heath, to the restless pioneers of "covered wagon" days. Anticipation is often more roseate than realization, and it reminds us of the young colored flapper who returned a pair of stockings to a large dry goods store.

"Why, Mandy," queried the proprietor, kindly, "didn't these stockings come up to your expectations?"

"I should say not, Mister Smiff; why, dey didn't even come up to mah knees!"

Fish Meal and Cod Liver Meal

With Special Reference to Their Mineral and Vitamin Content

By GEORGE H. CONN, Freeport, Illinois

FISH meal as a feed for live stock and poultry has come into prominence during the last few years. For many years the by-product of the fisheries has been prepared for fertilizing purposes and when so prepared has usually been called fish guano, although sometimes referred to as fish meal.

In the preparation of fish by-products for fertilizing purposes very little, if any, attention is given to the condition of the product; there is no necessity for observing any sanitary precaution or cleanliness, or even to exclude fish or fish by-products that are decomposing. In the preparation of fish meal for feeding purposes, only relatively clean and undecomposed fish and fish by-products can be used.

Due to the carelessness with which fish meal was originally made, and due to the fact that many of the early fish meals (fertilizers) were at times tried out as a feed for live stock and poultry, there was considerable prejudice against the use of this product for many years. There was also a prejudice against it for some little time on the ground that if fish meal was used for feeding, the flesh of animals consuming it would have a fishy odor and flavor. Germany demonstrated, through the use of a carefully and specially prepared fish meal, that it could be successfully fed without this result. One reason for this prejudice was due to the fact that the flesh of poultry and other live stock kept in many fishing villages usually had a fishy taste, the presumption being that this was due to the fact that the animal received fish meal. The real reason was the fact that these animals received little or nothing else but fish during their lifetime. When livestock and poultry are fed fish meal properly there is absolutely no danger of the flesh having a fishy taste or odor.

Fish meal should be made only from healthy, wholesome fish or raw material that has not decomposed. In the manufacture of fish meal it is usually heated to a very high temperature, which destroys all disease, putrefactive and other organisms.

Fish meal should not be fed in unlimited amounts to either live stock or poultry. It is a very highly concentrated product, and should be combined with other feeds that are less concentrated. It is a protein feed very similar to tankage or meat scraps. The proteins have to do with the production of flesh, muscle and body tissue. It is necessary, for good results in feeding, to combine it with grains, which are largely carbohydrates, in order to produce a balanced ration. Fish meal also contains a fairly good quantity of oils and carbohydrates which produce heat and energy.

From a large number of experiments made at leading experiment stations in this country, as well as some experiments in Europe, we find that fish meal is one of the most desirable protein feeds for live stock and poultry feeding.

The quality of fish meal and the general appearance depends upon the kind of fish from which it is made, and whether made from entire fish or from the by-product from fish canneries or oil producers.

The meal is often quite as important as the oil which is extracted from the fish, but it is usually regarded as a by-product after the oil is removed from the fish. So popular has fish meal become in recent years, there is possibly a question in some instances whether fish meal or fish oil is the by-product. Fish oil is very widely used, principally as a substitute for linseed and similar oils in the manufacture of paints, soaps and similar products. When fish meal is manufactured from the by-products and the trimmings from salt fishing, this product is likely to contain a considerable quantity of salt. There will be no serious objection to this, providing the salt content is not higher than 6%.

Fish meal should be so prepared that it does not contain an excessive amount of moisture, as this is likely to permit the product to become moldy on standing. Fish meal must be properly stored and watched carefully unless one is sure that the moisture content is low.

There is usually found remaining in ordinary grades of fish meal from 4% to 6% of oil or fat. This is considerable more oil or fat than is found in most feeding stuffs.

Fish meal is made in very much the same manner as fish scrap is prepared for fertilizer purposes. This is done by steam cooking of the raw material, pressing and drying. The principal difference between the preparation of fish meal for feeding and fish scrap for fertilizer purposes is the difference in the raw material used. The material used for producing fish meal is clean, fresh, raw material and is handled under sanitary conditions.

As a general thing, the lower the oil or fat content of fish meal the more desirable it is as a feeding substance. There is one advantage that the low-fat fish meal possesses and that is, it is not so likely to produce any digestive disturbances. On the other hand, the oil or fat content of fish meal supplies the highly desirable vitamins A and D and for this reason it is desirable to have as high an oil content as can be secured, consistent with good keeping qualities.

At the present time most of the feeding fish meal that is manufactured in this country is produced from Menhaden fisheries which produce fish oil. Most of the fish canneries, where large amounts of fish scrap and waste fish are secured, manufacture their by-products and waste products into fish scrap or fertilizer materials. It is said that fully one-fourth of the total weight of salmon at the salmon canneries is thrown away, but several of these have in operation at this time small fertilizer plants, which manufacture this waste material into fertilizer. As the demand increases for fish meal and for high grade fertilizers it is quite likely that practically all fish canneries and other fisheries where there is an appreciable amount of fish waste will utilize these products either as fish meal for feeding purposes or as fish scrap for fertilizer.

There is considerable variation in the analysis of fish meal, but with modern equipment the producer of fish meal is able to manufacture a very uniform product. The best known grade of fish meal on the market today has the following guaranteed analysis:

Protein	55%
Fats	4%
Fibre	2%
Minerals	15%

Another grade of fish meal, which is made from shrimp refuse and which is known as Shrimp Brand, has the following analysis:

Moisture	5.03%
Minerals	29.89%
Fat	3.62%
Protein	47.44%

It is absolutely necessary in buying fish meal to buy from a reputable manufacturer, as several analyses of various makes of fish meal show such a wide variation in the analysis.

The analyses of these various fish meals range as follows:

Water	5.90% to 18.91%
Crude Proteins	38.83% to 58.96%
Digestive Protein	30.43% to 54.52%
Fat	1.55% to 14.03%
Phosphate of Lime	7.80% to 36.16%
Salt	0.70% to 20.10%
Ash	20.53% to 45.07%
Sand	0.10% to 6.05%

With modern methods of manufacturing and a definite demand from the feeder for a guaranteed product, the manufacturers of fish meal will develop a standard product.

In addition to the protein, carbohydrates and minerals that fish meal contains it also has considerable anti-rachitic properties, due to the vitamin D which is contained in the small amount of oil which remains in the product. This is an important factor, for it is becoming necessary with many herds and flocks to supply similar material to prevent rickets. Fish meal that is rich in oils or fats will go a long way toward preventing this disease.

Practically all kinds of live stock and poultry have been fed on fish meal, although in the United States its use has been principally for feeding swine and poultry. In European countries cattle, sheep and horses have been fed fish meal with good results.

As a general rule, from one-eighth to one-tenth of the total dry ration by weight may be composed of fish meal. Pigs may receive from one-fourth to one-half pound per day, according to weight; cattle as much as two pounds per day for each 1,000 pounds live weight; sheep one-tenth to one-fifth pound per day for each 100 pounds live weight. Poultry should not receive more than 10% of their total ration as fish meal.

A summary of several feeding experiments at the Ohio Agricultural Experiment Station proved that fish meal for young pigs was even superior to tankage, while for older pigs there was practically no difference between the two feeds. One fact was evident throughout all of these feeding tests—that the different lots that received fish meal were free from stiffness or crampiness, which usually results when hogs are fed a ration that is deficient in minerals and vitamins.

The South Carolina Experiment Station at Clemson Agricultural College conclude that fish meal is superior to tankage as a supplement to shelled corn for pigs in dry lots. This is especially noticeable in young pigs. Their findings are practically the same as the Ohio Agricultural Experiment Station.

A summary of eleven tests given in Henry and Morrison's "Feeds and Feeding" shows that fish meal was superior to tankage in ten out of these eleven tests when fed to swine. With most of these tests the protein feed was used as a supplement to corn. The average of these tests shows that it required 33 pounds less corn and four pounds less fish meal to make 100 pounds of gain than it required of tankage.

In two tests made at the Iowa Experiment Station, fish meal was self-fed to swine and in these two tests it was practically equal to tankage. In each of these lots there was no evidence of rickets or stiffness in pigs and in this respect fish meal is probably considerably more efficient than tankage.

Fish meal from which the fat has been extracted has been found equal to cottonseed meal for feeding dairy cows. It has been determined that cows may consume as much as 2 pounds of fish meal per day without there being any odor in the milk. Fish meal is not generally used in this country for dairy cattle.

Fish meal probably has its greatest usefulness in this country in the feeding of poultry. It is a very valuable protein feed and in addition to a high grade protein it supplies considerable minerals. It has considerable vitamin content and particularly vitamin D, or the anti-rachitic vitamin, which prevents rickets or leg weakness. It is quite possible that later experiments will show that fish meal is a very good product for the prevention of this trouble in growing pigs. It is quite possible that fish meal is rich in iodin.

It is reasonable to suppose that fish meal is fairly rich in vitamins for the reason that it retains some of the original oil which is of practically the same composition as the oil which has been expressed from the fish. Since this oil is rich in vitamins, especially in the vitamin A, or growth promoting vitamin, and vitamin D, the anti-rachitic vitamin, it follows that this product should be fairly rich in these two vitamins, which are very essential for the growth and proper development of young live stock and poultry.

Cod Liver Meal

Cod liver meal is a new commercial product which is just now becoming of general use in the United States. The first cod liver meal has not been introduced commercially more than two or three years and has been used principally in poultry feeds. At the present time two or three popular poultry feeds contain cod liver meal as one of the ingredients.

Cod liver meal is a by-product of the cod liver oil industry. Until recently this by-product was dried and made into a fertilizer if used at all. A goodly portion of it was, no doubt, dumped into the ocean and no use made of it.

One reason that cod liver meal has not been prepared and used more as a live stock and poultry feed is due to the fact that, unless the producer is willing to pay the seller a certain price for the livers from which he extracts the medicinal cod liver oil, the seller will produce as much medicinal cod liver oil as the livers will produce without any great expense, then the second grade, or red oil, will be produced by him, after which the residue is sold to fertilizer manufacturers. In this manner the fishermen secure a greater price for their livers, but the grade of oil that they produce and the uniformity cannot be depended upon; therefore, the larger producers and refiners manufacture medicinal cod liver oil and then further treat the livers for a second run of oil, which is known as cod oil, which is principally used in industry. This cod oil is very dark in color and when cold will become solid. This cod oil, however, is very rich in vitamin A, the growth promoting vitamin, and vitamin D, the anti-rachitic vitamin, both of which are found in abundance in medicinal cod liver oil.

In the refining of medicinal cod liver oil a considerable quantity of footes, which is composed principally of stearin, is secured when the oil is reduced to a low temperature. These footes are valuable for the manufacture of soap and similar products and since they are, no doubt, rich in vitamin A and vitamin D they would also be valuable in mixing with cod liver meal to increase its vitamin content. Cod oil, which is not used in this country to any extent for medicinal purposes, is very widely used in Norway and in other European countries for live stock and poultry and is known as "veterinary oil."

The manner in which cod liver meal is prepared will have considerable effect upon its vitamin content. Cod liver meal that is prepared in a vacuum dryer where it does not have access to the air and where it is not heated excessively will be much richer in vitamin than a cod liver meal that is prepared under ordinary conditions. Where considerable heat is used practically all of the vitamin A content is destroyed. Therefore, the best grades of cod liver meal are very carefully prepared in vacuum dryers at a low temperature. Such cod liver meals are very rich in vitamins.

While cod liver meal has a very high protein content, being nearly as rich in protein as tankage or meat scraps, both of which are very high grade live stock and poultry protein feeds, it is not due to its protein content that cod liver meal is used for live stock. It is used principally for its vitamin content. In this respect there is no doubt but that it can be used in most places where cod liver oil is now used for live stock and poultry.

There is considerable variation in the analysis of cod liver meal as shown by the several analyses given herewith.

Norwegian Cod Liver Meal

Digestible Protein .....50 to 55%
Cod Liver Oil (Fats)....25 to 30%

The analysis of a popular brand of cod liver meal, as given by the manufacturers, is as follows:

Average Moisture 4.95%
This analysis made on a moisture free basis—
Fat 40.79%
Crude Protein 40.58%
Digestible Protein 35.71%
Nitrogen-free Extract 14.89%
Minerals 2.94%
Phosphoric Acid 0.39%
Iodin parts per million..... 187
Co-efficient of digestibility... 88%
Vitamin D—Sufficient when 1½ per cent. of the ration is cod liver meal.

A representative analysis of Newfoundland produced cod liver meal, as given the writer by one of the leading brokers and manufacturers, is:

Moisture 5.32%
Fat 45.38%
Proteins 43.57%
Ash, etc..... 5.73%

It is evident from the variation of the analysis of the different cod liver meals that the composition depends largely upon the closeness with which the manu-

facturers extract cod liver oil from the livers. When but a small amount of cod oil is removed from the livers the resulting meal will be very rich in fats, which are principally cod liver oil.

We know that when the feeds given to young live stock and poultry are deficient in vitamin A and vitamin D that they fail to grow naturally and even develop bone diseases, such as rickets. Malnutrition, lower resistance to disease, sterility, etc., will also be the result of a ration deficient in vitamins. In fact, very serious disease conditions are likely to result when these two vitamins are deficient in the rations supplied under ordinary conditions. In the United States it is a comparatively simple matter to supply sufficient of the growth promoting vitamin, or vitamin A, in the form of yellow corn, milk, etc., which are rich in this vitamin. It is not so easy to supply vitamin D, or that vitamin which has to do with the proper growth and development of the skeleton. This can only be supplied by such products as cod liver oil and cod liver meal and through the influence of direct sunlight. Green feeds are also very rich in this vitamin, which accounts for the fact that we rarely experience this class of diseases during the summer months, when the animals have access to green feeds under natural conditions.

Cod liver meal, containing 35% or more of fats, is a very prolific source of vitamin D and also of vitamin A, providing it has been made under proper conditions. If this cod liver meal has been produced in vacuum batch dryers at a low temperature it will still retain considerable of its vitamin A. It is quite likely that satisfactory results would be secured when 1½% to 2% of the complete ration of poultry was composed of cod liver meal. For young swine it would probably require slightly more than this, probably from 2½% to 4% of the entire ration.

The fact should not be lost sight of that cod liver meal is extremely rich in iodin—is one of the richest natural sources of iodin that we have. For this reason cod liver meal would be especially valuable for feeding breeding stock in those areas where goitre, or big neck, is prevalent.

Present indications are that cod liver meal will increase in popularity and usefulness as additional experiments prove the exact vitamin content of this product. In addition to the vitamins that it contains and the iodin which is a very valuable mineral, the protein which it contains is superior to any other protein in common use with live stock and poultry today.

TETANUS IN A MULE COLT THREE WEEKS OLD

April the 8th, 1929, I was called to the farm of Walter Schoonover one and one-half miles east of Anadarko, to see a baby mule colt three weeks old. On arriving I found the colt had a well developed case of tetanus; the infection having occurred through the umbilical cord. I gave the patient 500 units of tetanus antitoxin.

On my return the next day I found the patient down and as stiff as a board. I advised the owner to make the little fel-

low as comfortable as possible. He did so. We placed the patient on a thick bed of straw and placed a pillow of straw in a sack to support its head. I then gave 1,000 units of antitoxin and increased 500 units daily till 2,500 units were given. 50,000 units were given in all. In addition to the antitoxin I prescribed atropin sulphate 1/16 of a grain given orally in sugar of milk ever three or four hours to control the spasms.

The mother was milked and the colt fed every two or three hours by hand pouring the warm milk into a small long necked bottle. Fresh water was given freely.

The bedding was kept clean and fresh and the patient was turned every three or four hours from side to side.

This patient made a wonderful recovery in 40 days from the time the first symptoms were noticed.

Anadarko, Oklahoma. F. W. Hall.

A RECORD IN TUBERCULIN TESTING

Slightly more than a million tuberculin tests have been applied during a month eight times since the work began in 1917, but at no time was the number so great as during May of the present year, when 94,517 herds, containing 1,193,660 cattle were tuberculin tested.

VACCINATING DOGS AGAINST RABIES

Experience in Detroit indicates that vaccination of dogs against rabies is of material value in combating that disease although it is not one hundred per cent efficient. Out of 2,783 dogs known to have bitten persons during 1928 and which were investigated carefully, 581 had been vaccinated and 2,202 had not. Among the 581 which had been vaccinated three, or 0.52 per cent, were found to be rabid, while 131, or 5.94 per cent of the 2,202 unvaccinated dogs, had rabies. These figures suggest that unvaccinated dogs are over eleven times more apt to get rabies than vaccinated.

Furthermore, out of 28,000 dogs which were vaccinated in Detroit 10 contracted rabies, while among the other 98,239 (estimate) dogs in the city there were 441 cases. This gave a rate of 0.36 cases of rabies per 100 vaccinated dogs and 4.49 per 100 unvaccinated dogs.

These figures indicate that the unvaccinated dog is 12 times more liable to rabies.

Mortality from rabies among Detroit dogs was at the rate of 35.7 per 100,000 among the vaccinated and 449 among the unvaccinated.—*Illinois Health Messenger.*

1,000 "FAMILY COWS" REACT TO TUBERCULIN

The following table covers the post-mortem examination upon 1,000 family cows reacting to the tuberculin test in New York State during the period 1921 to April 1, 1929. These cows were condemned in 57 different counties and the tuberculin tests applied by approximately 100 different veterinarians.

Number of family cows reacting	1,000	
Number of generalized cases	111	11.1%
Number of localized cases	818	81.8%
No visible lesions	71	7.1%

Albany, N. Y. E. T. Faulder.

RESULTS OF PROPHYLAXIS AGAINST RABIES IN ITALY

The regulation dictated by the home ministry to the veterinary police for the purpose of obtaining better prophylaxis against rabies are now in effect and have begun to yield results. Statistics on anti-rabic treatment in several institutions of the kingdom show a progressive decrease in the number of cases of rabies. Whereas, during the first half of 1927, 3,591 persons were bitten by mad dogs, the number decreased to 2,996 during the second half of 1927, and to 2,402 during the first half of 1928. Cases of dog bite from rabid dogs or from dogs suspected of being rabid have shown a decrease of about 33 per cent.—*Jour. A. M. A.*, Vol. 92, No. 21.

Wild Tobaccos as Stock Poisoning Plants

By L. H. PAMMEL, Ames, Iowa

IT HAS long been known that the products of the common tobacco contain toxic alkaloids, like nicotin, with strong toxic properties, and also contains picolin nicotemin.

The cases of stock poisoning from common tobacco juice made from *Nicotiana tabacum* are not infrequent. All of the experiments made from this juice leave no doubt as to the toxic action of common tobacco. The plant is not eaten because it is unpalatable. It has also been recognized that the Australian *Nicotiana suaveolens* is poisonous. The commonly naturalized tree tobacco *Nicotiana glauca* of south-western United States, particularly California, is said also to produce blindness in stock and, in Australia especially, is poisonous to ostriches.

Only recently it has been recognized that some of the wild tobaccos of the west are injurious to live stock on the range. Dr. C. Dwight Marsh, Dr. A. B. Clawson and G. C. Rowe, in a recent article on wild tobaccos (*Nicotiana trigonophylla,* Dunal, and *Nicotiana attenuata,* Torrey on Stock Poisoning Plants).* New Mexico in 1923 sent some specimens which one of his assistants, Mr. T. W. Crump of his force, thought was injurious to live stock. The specimen proved to be *Nicotiana trigonophylla,* to which later *Nicotiana attenuata* was added. The tobaccos are rank smelling, sticky herbs, acrid and narcotic.

Marsh, Clawson and Rowe give the following early observation on poisoning from the *N. trigonophylla* which had been eaten by cattle. They say: "One sick cow seemed to be paralyzed in the fore quarters, but otherwise had no marked symptoms. She was killed for an autopsy, which was negative. An uneaten patch of the plant was marked, and the cattle in the vicinity were driven away about a mile. On visiting the locality the next day it was found that the cattle had come back and eaten the tobacco on the market patch.

"Two yearling steers were found about 50 yards from the place. One was lying down, and on being approached attempted to rise. He got upon his feet with great difficulty, shaking and shivering all over. The eyes were staring, the head jerked from side to side, and there were severe, clonic spasms of the muscles of the neck and shoulders. He staggered a short distance and fell. The other steer attempted to rise, but was unable to get upon his feet. He had been vomiting during the night. Breathing was slow and labored and the pulse rapid and weak. There was muscular twitching all over the body, and he rolled his eyes back at times until only the whites were visible. There was some salivation. None of the animals were bloated. In the same neighborhood where the cattle were poisoned Crump found a number of skeletons of sheep, which presumably had been killed by the same plant."

The authors, from their extensive experiments, conclude as follows: "The minimum toxic dose for sheep was 2.25% of animal weight of green plant, and the lethal dose was 3.6%. There was only one lethal case, sheep 920. As sheep 912 was made sick on 3.7%, it is presumable that 3.6% is close to the minimum lethal dose. It should be noted, however, that sheep 920 received stems, while sheep 912 received leaves and flowers. While it is supposed that there is little difference in toxicity between the leaves and stems, there were no experiments to make sure of this. It is, therefore, possible that the stems are more toxic than the leaves. Only one chicken was used, and that was made sick by a dose consisting of 5% of its weight. Since in the work with *N. trigonophylla* no effect was produced by 5.68%, it is probable that 5% is about the minimum toxic dosage.

"So far as the experiments go, with the comparatively small number of animals, it

*Technical Bulletin, United States Department of Agriculture, No. 22.

may be inferred that *N. attenuata* is somewhat less toxic than *N. trigonophylla.* There is, however, no material difference between the two species.

Animals Poisoned by N. Attenuata

"As the experimental work with sheep showed clearly that the symptoms and dosage of *N. attenuata* differed only slightly from those obtained in the work with *N. trigonophylla,* it did not seem necessary to try out the plant with horses and cattle. The single experiment with a chicken indicated the same lack of susceptibility which was found in *N. trigonophylla.* It may be concluded that cattle, horses and sheep may be poisoned by *N. attenuata* and that chickens are practically immune.

Summary

"The experimental work with *N. trigonophylla* showed that it is distinctly poisonous to cattle, sheep, and horses, producing typical tobacco symptoms.

"Generally speaking, the poisonous effects appear very soon after the feeding and in some cases continue for a considerable period.

"Of the animals used in these experiments, the cattle were much more susceptible than the sheep. The susceptibility of the horses was about the same as that of the cattle. Fatal results are more liable to occur with cattle than with the other animals experimented upon.

"The poisoning of chickens is a very improbable occurrence.

"The remedy for live stock poisoning by *N. trigonophylla* on the range lies in prevention, by taking care that animals have a sufficient supply of other forage, and in the destruction of the plant.

"The symptoms produced by *N. attenuata* are closely identical with those produced by *N. trigonophylla.*

"The toxic and lethal dosages of *N. attenuata* are somewhat greater than are those of *N. trigonophylla.*

"There is a possibility of the poisoning of chickens by *N. attenuata,* but the dosage required is so heavy that it probably never occurs, except as produced experimentally."

BLACK LOCUST POISONING

A. J. Woodrow of Perry, Missouri, writes as follows:

"We had six yearling cattle running on pasture this season. Part of the pasture to which they had access we have always had cattle do well on. We noticed they were not doing well, but thought it might be due to the flies being so bad this season. The pasturage was good. We later found most of them had become very much emaciated. We found that in a pasture to which they had access they were eating greedily of honey locust pods. There were also black locust trees in this pasture, but the cattle had not eaten of them so far as we could tell. There were also some small coffee bean trees that they might have eaten the pods from earlier, but we could find no pods at that time, that the trees had produced. The cattle were scouring very badly.

"Will you be so kind as to give us a decision as to whether the honey locust pods are poisonous and injurious to live stock? Something has poisoned these cattle; personally we think it was the honey locust pods, but we might be mistaken."

It is difficult to diagnose this case. I do not think that eating the pods of the honey locust, *Gleditsia triacanthos,* is responsible for the trouble. This is frequently eaten by stock and, so far as I know, without any injurious effects.

In the case of black locust it is entirely different. This is known to be quite a toxic plant. The bark, leaves and even flowers are toxic. Of course there may have been other toxic plants in the pasture. The coffee bean, *Gymnocladus dioica,* is toxic. The Kentucky coffee bean contains the alkaloid cytisin, a crystalline bitter and caustic substance which causes dilation of the pupil. The pulp of the pod has long been used, mixed with milk, to poison flies.

The black locust contains the toxic substance robinin. Animals that are poisoned have the following symptoms: inability to hold the head upright, nausea and attempts to vomit. The action of the heart becomes feeble. The poisoning resembles that of belladonna, according to Dr. Johnson.

Ames, Ia. L. H. Pammel.

RIDING HORSES FOR THE MILITARY SERVICE

Though the Army's horsebreeding activities have been in operation but eight years, the 600 stallions now used by the remount service produce more than 15,000 foals annually, amounting to a money value of more than $1,500,000. In these days when there is a great deal of talk of relief for the American farmer, the Army, though not generally known, is playing an important role in assisting the American farmer.

"When speaking of farm relief," said General Cheatham, "it should not be overlooked that the Army has been for the past eight years helping farmers and breeders in grading up their horse breeding stock by furnishing the services of well-bred stallions, at nominal cost, in order to encourage the breeding of riding horses suitable for military service. There are now some 600 of these stallions, owned by the government, at service all over the country. Their annual produce numbers more than 15,000 foals, having a money value in excess of a million and a half dollars.

"Besides furnishing stallions, the Army also supplies a valuable market for these foals. The Army requires from 2,000 to 3,000 horses annually to replace losses by death and disease. Many of the horses now being bought for the Army are the produce of government stallions on scattered farms and ranches, and as time goes on it is entirely possible that all Army horses will be so supplied. In addition, many breeders employing government stallions have profited by the steadily growing demand for high-class riding horses, and have sold their best colts for $500, $1,000, and even more per head. I was advised recently by a prominent Texas breeder that he had sold one of his five-year-old horses, sired by the Army stallion "Square Set," for $3,500. I am informed this case is not exceptional, for hunters and jumpers bred by Army stallions are frequent blue ribbon winners at our big horse shows and are held by their owners at fancy prices."—*Army and Navy Register.*

TETRACHLORETHYLENE EFFECTIVE AGAINST SHEEP PARASITES

Tetrachlorethylene makes short work of most of the common internal parasites of sheep. The drug is a colorless liquid having an odor resembling that of ether and belongs to the same chemical group as carbon tetrachlorid which is used extensively in human and veterinary medicine and in industry.

As in the case of carbon tetrachlorid, the value of tetrachlorethylene in the treatment of worm infestation was first ascertained in the Zoological Division of the Bureau of Animal Industry. In the opinion of Dr. Maurice C. Hall, chief of the division, the tetrachlorethylene treatment is another advance step in the control of sheep parasites.

Drug Is Given in Capsules

Tetrachlorethylene, in single doses, has been found to be approximately 100 per cent effective against the sheep stomach worm, and is also very effective against the hookworm and some of the other roundworms found in the small intestine of the sheep. The drug is given in capsules in doses of 5 cubic centimeters for an adult animal. The animal should not be fed for 12 hours before treatment. Bad results may follow if the capsules are broken in the mouth.

Repeated Treatments Advised

While tetrachlorethylene will kill practically all the stomach worms, at one dose, the fact should not be overlooked that sheep remaining on infested pastures will continue to pick up infection and will have to be treated more than once. This is particularly true in heavily infested flocks and in parts of the country, such as in the South, where conditions of heat and moisture and heavy stocking on good pastures are most favorable for the propagation of parasites.

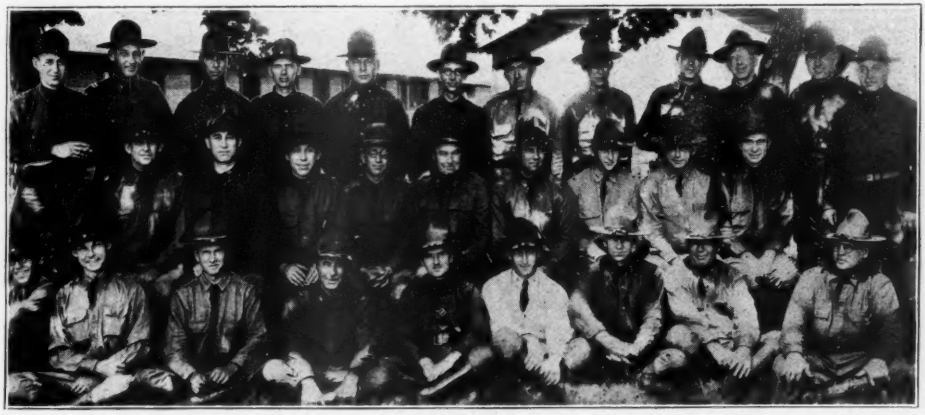
MANUFACTURERS OF DOG MEDICINES WARNED

No drug or combination of drugs known to veterinary science can truthfully be offered to the public as a treatment for such dog ailments as distemper, the so-called "running" or barking fits, black tongue, demodectic or folicular mange, or for all types of worms found in dogs, say officials of the Food, Drug, and Insecticide Administration, United States Department of Agriculture.

Drugs labeled for these diseases, or bearing any names suggesting these conditions, or labeled with such a phrase as "formerly called distemper medicine," are misbranded within the meaning of the Federal Food and Drugs Act.

While there are drugs known to be effective in ridding dogs of certain types of intestinal worms, these drugs are more or less specific and cannot be recommended, either alone or in mixtures of drugs, for all types of worms infesting dogs. Makers of these products should therefore confine their claims to the worm or worms against which the product is effective.

Mange cures will also be deemed misbranded when their makers claim them to be merely mange cures without specifying the particular form of mange. For demodectic or follicular mange, there are no effective treatments known, while for the sarcoptic form effective medicines should name sarcoptic mange. The use of the term "mange" unqualified, is a violation of the Federal Food and Drugs Act and also of the Federal Insecticide Act. According to the latter act, correct labeling should also include the name and percentage of each inert ingredient.



VETERINARY RESERVE OFFICERS AT CAMP SNELLING

This group shows 30 of the 35 Veterinary Reserve Officers, U. S. A., that were on a tour of active duty July 7-20, 1929, at Camp Snelling, Fort Snelling, Minn. The 25th Veterinary Evacuation Hospital was organized and functioned during the camp period as a training for the officers. This is the first time that an independent Veterinary Unit of the Reserve has been ordered out for training. This organization was highly commended by the Camp Commander for their efficiency and, no doubt, other such units will be ordered out for future camps. Rear Row, Left to Right: Capt. E. F. Kallenberg, Capt. R. A. Moye, Lt. R. S. Norton, Lt. R. A. Telford, Lt. J. A. Teie, Lt. C. W. Picht, Lt. L. E. Dietrich, Capt. F. Low, Capt. J. O. Schlegel, Major J. G. Noble, Major F. B. Croll, Capt. R. D. Wall. Middle Row: Lt. Col. L. R. Smith, Commanding Officer, Capt. H. W. Tornow, Lt. M. L. Dietrich, Capt. W. L. Williamson, Lt. W. G. Lashbrook, Major O. C. Selby, Executive Officer, Lt. F. A. Bonnstetter, Major W. E. Muldoon, Plans & Training Officer, Lt. A. L. Born. Front Row: Lt. I. C. Munger, Jr., Lt. C. A. Ashby, Lt. L. O. Fish, Lt. R. S. Walden, Lt. R. K. Hawley, Lt. D. W. Wright, Lt. D. H. Bibens, Lt. E. M. Brady, Capt. C. H. Hart. Other Veterinary Officers attending Camp, but not present when picture was taken, were: Capt. A. C. Barr, Major Geo. E. Bartholomees, Capt. Julius Stotchik, Capt L. E. Willey, Major F. J. Younglove.

The Control of Anthrax in the South—Particularly Arkansas*

By J. H. BUX, Little Rock, Arkansas

ANTHRAX is confined to certain districts in the lower Mississippi Valley where the moist, marshy or periodically inundated soil is suitable for the growth of anthrax bacilli. It appears in these sections almost annually either on isolated premises or in widespread areas, principally among animals on pastures and ranges during the summer months. Records indicate that there has been no appreciable extension of the infected areas in Arkansas for 23 years; although inquiry among the old residents discloses that the disease undoubtedly was prevalent as early as 1872. This non-extension is due to the better drainage and unsuitability for anthrax propagation of the soil in adjacent areas. The infected areas include the densest biting fly infested districts, and the prevalence of such flies is observably greater during extensive outbreaks.

The virulence varies greatly in different sections and seasons. In some areas it has always been low; in others very high; never has a section or a farm of high virulence permanently become one of lower virulence; one large section of low virulence for years manifested a great increase in virulence in 1924. The points classified as of high virulence are not so every year; virulent outbreaks occur at intervals of several years, between times milder outbreaks or none occurring. The average virulence is higher in humus or organic laden soil. Virulent attacks may appear on only one or a few premises in a general low virulent outbreak in a county. The outer border lines of outbreaks often are areas in which outbreaks occur the next year. It occurred in epizootic form in 1916, 1920, and 1924, which indicated a regularity, but quadrennial year 1928 brought no widespread outbreak. Definitely, it may be stated that extremely wet periods followed by dry and hot periods so as to produce rapid recession of the amount of moisture in the soil are favorable for anthrax outbreaks. This is corroborated by the observation on a number of individual premises by veterinarians that losses have been stopped in infected herds where animals were feeding on young tender grass along the edge of large ponds during periods when the amount of water therein was diminishing and the weather hot by fencing the water or removing the animals.

Soil becomes infected by deposition of the blood and intestinal contents of affected animals and more frequently by decaying anthrax carcasses. It may remain infective for years due to spore formation.

Infection of herbivora is by ingesting forage or water contaminated with infected soil; carnivora by feeding on anthrax carcasses; milk is not a disseminator. Secondarily, infection is through the bites of flies. Wound infection is rare. Human infection is through wounds and all the few cases observed in Arkansas were due to skinning carcasses or less often handling sick animals.

Characteristic of anthrax bacilli having practical field value are: they never form spores in the tissue fluids of living animals, in unopened carcasses, or in slaughtered meat, and are not found in the blood stream of living affected animals until a few hours before death or not until actual death. Bacilli are killed by drying in sunlight in from 6 to 15 hours; the spores similarly treated survive for at least 18 years and doubtless

*Presented at the 36th annual meeting of the Missouri Valley Veterinary Medical Association, Omaha, July 8-10, 1929.

longer; spores are also equally more resistant to chemical agents.

The symptoms of anthrax are in general those of an acute septicemia, distinguished by excessively high temperature, colic, discharge of blood from respiratory and digestive tracts, hot painful rapidly forming edematous bodily swellings with well marked lines of demarcation. Animals may die without noticeable symptoms in extreme acute attacks. These symptoms on individual premises or in areas may and often are less severe. Some being so mild as to only resemble anthrax in a few local bodily swellings; some being due to a mild type of infection other than anthrax or auto-intoxication, known as "nigger charbon" and as "psuedo-anthrax."

The anatomical changes of anthrax vary but briefly, are serous and hemorrhagic infiltration of the subcutaneous and subserous connective tissues, gelatenous infiltration of muscular tissue, acute swelling of the spleen and lymph glands, congested lungs, liver, and kidneys, and other lesions found in septicemic diseases; or all changes may be absent in very acute cases. Anthrax carcasses decompose rapidly, bloat enormously, rigor mortis is incomplete and the blood tarlike and non-coagulated.

Certain diagnosis of peracute cases of anthrax on the living animal is hardly possible. Less acute cases are indicated by the sudden appearance of the prominent symptoms mentioned heretofore, history of previous infection, favorable season, and extensive losses. Animal inoculation affords a reliable diagnosis. Microscopic examination is undependable due to the utter impossibility of differentiating anthrax bacilli from some of the other pathogenic and saprophytic organisms, except anthrax bacilli found in blood taken from living affected animals as there are no known similar bacilli which circulates in the blood.

The number of animals infected in some of the least virulent outbreaks is often less than 1% of the total. It may be as high as 100% on heavily infected premises. The percentage of affected animals dying varies from none to 100; it decreases as severe outbreaks progress and diminish in virulence. During widespread outbreaks a number of farms escape which makes the percentage of loss of the total number of animals in the section small. Forty to sixty per cent of the total number of the animals of infected herds may die where no control measures are instituted.

Local treatment is unsatisfactory. Incision of swellings is not practical. Unfortunately many empirics and farmers do apply severe blistering agents, some of them so strong as to be inhumane. Counter irritants are not only valueless, but probably aggravate the swellings. The general confidence in this line of procedure is doubtless due to its apparent success in treating "nigger charbon," pseudo-anthrax or very mild cases of true anthrax. The same reason can be assigned for the reported cures of anthrax. There is positively no cure for anthrax. Large doses of anti-anthrax serum do assist in some instances, but this product cannot be classified as a cure.

Anthrax control is divided into three phases. First, the general observance of the destruction by burning of all carcasses where dying or removing on flat boat and burning it with carcass, covering carcasses with burlap, etc., or saturating with oil or other repellent, as soon as dead, utilization of fly repellants, especially on severe cases approaching death—covering with burlap blanket treated with repellent increases efficiency —withholding animals during the summer months from known infected ranges, preventing them from drinking putrid water, and providing of dry feed during outbreaks.

Second, administration of prophylactic treatment annually in February or March for a maximum of immunity during the season. The triple treatment is recommended, consisting of the subcutaneous administration of 10cc of anti-anthrax

serum simultaneously with 1cc of anthrax spore vaccine; in two weeks 1cc of a stronger spore vaccine, and two weeks later 1cc of a still stronger spore. Animals of exceptionally low vitality should not be treated, as occasionally losses follow. Inasmuch as anthrax immunity appears to be of somewhat short duration and immunity is relative, it has been found that a greater number of animals can be saved if herds that have been given the prophylactic spring treatment are again retreated with about 50cc serum for horses and mules and 35cc preferably intravenously, for cattle should virulent outbreaks occur. Serum alone gives an immunity of about eighteen days. Outbreaks rarely average more than forty days. Two serum alone treatments usually suffice. Good results may also be secured by the taking of temperature of vaccinated work or dairy animals twice a day and giving those that show a temperature a 100cc of serum. Some will be treated that do not have anthrax, but many are saved.

Third, the treatment of unvaccinated animals during outbreaks has been found most satisfactory by the use of serum alone as outlined heretofore. Giving animals visibly affected or showing elevation of temperature 100cc of serum, to be repeated if advisable, a recession of temperature or an improvement in general appearance being the signals for more serum. This often occurs, demonstrating that the product does exert a favorable influence. Strict attention to sick animals always assists greatly in suppressing outbreaks. It has been found that liberal doses of serum alone usually stops appearance of new cases in ten days and the common prophylactic methods of small amounts of serum with spore or the aggressin alone require a longer period of time. Also the prophylactic treatments are followed by a brief negative phase of increased susceptibility which in virulent outbreaks may increase the number infected. If spore or aggressin is given the extra dose of serum should be added. Attempts at underdosing are always detectable in unsatisfactory results.

My personal observation, corroborated by others in the department and the records thereof, disclose that many other combinations and varieties of anthrax biologics have been used with apparent good success, and they all give varying degrees of immunity, but it is desired to state most emphatically that they have positively not stood the test during exceptionally virulent outbreaks or on premises that are known to be affected with bacilli of very high virulence. Glowing reports are received every year on large numbers of animals saved by various biological treatments, including nostrums, quack remedies, etc., in areas known to be infected with "nigger charbon" or pseudo-anthrax or even with the mild cases of true anthrax. The prophylactic triple treatment and serum in outbreaks are not one hundred per cent perfect, but the writer is most firmly convinced that it is profitable in infected districts to use this. Herds treated prophylactically do not have as high a percentage of infected animals during outbreaks as non-vaccinated and those contracting it are not so severely affected as the non-immune, neither is the mortality so high. Similar favorable results accrue from the use of serum during outbreaks. Cattle respond much better than other species to vaccination. The advocacy of serum alone in outbreaks is not in conflict with the recommendation of the biological houses. They all warn against the use of spore vaccines or aggressin in infected animals. Experience has shown that practically it is not possible to determine all incipient cases, hence all animals are regarded as infected. Usually stock owners do not give the prophylactic treatment except during seasons following outbreaks when the disease is normally at a low ebb. By the time it is due to appear, few animals have acquired immunity.

The control of anthrax thus becomes

largely a problem of suppressing outbreaks, drainage and crop rotation for anthrax eradication are impractical in infected districts. The virtual disappearance of anthrax from Southern Illinois after its drainage and cultivation is proof of the measures needed for eradication. Stock owners in anthrax districts ultimately co-operate fully with veterinarians and sanitary officials because at some time a virulent outbreak occurs and unless aggressive measures are taken, the losses are heavy. There always is a time when to the inexperienced it appears that all the animals in a territory will die. This is a good time to start serum administration as virulency has diminished somewhat and general results are good because of united action. Unfortunately, this is also the stage when those dispensing sure cures, cure alls, special formulas, blood letting, etc., utilize the hysteria of the stock owning public to ply their trade; and, alas, too often apparently successfully as many are crafty and do not attempt their nefarious activities in infected herds. Free publicity as to the location of outbreaks and ignoring these imposters until they encounter severe cases is the best means of suppressing them. Prosecution of one notorious Arkansas and Louisiana offender was attempted. It was difficult to secure a conviction in Justice of Peace Court as farmers testified that he had controlled anthrax among their stock and that the state veterinarian was prosecuting him because he is not a veterinarian. We appealed the case to Circuit Court and won easily as in the meanwhile virulent anthrax appeared among the herds of some of his staunchest supporters with disastrous losses.

The application of quarantine measures are ineffective in confining the disease to any particular section. Individual premise quarantines, or if considerable area is involved especially open range, general orders preventing the movement of animals out of a district in which the disease is raging and automatically quarantining all herds containing sick animals is sufficient. These are not issued as a rule, unless there is some assurance given by peace officers that they will really be enforced. Often county officials employ riders for enforcing quarantine and for finding carcasses and securing their cremation. It is very noticeable that the benefits of the use of biologics is greatly enhanced when carcasses are promptly and properly destroyed.

Conditions are unfavorable for eradication, extensive outbreaks will occur, all the known combatant measures must be utilized for reducing the losses to the minimum; improvement of methods will doubtless be projected, especially the biologicals; co-operation of all agencies is necessary, veterinarians being the back bone of all such programs for the control of anthrax. Anthrax losses can be held to a low point by aggressive action.

MILK DISEASES DYING OFF

Milk-borne epidemics seem in a fair way to become tradition, especially in the cities. In towns there is still some danger. Since the country people rarely use common milk supplies they have few milk-borne epidemics which extend beyond the limits of one family or one farm.

In 1926 the U. S. Public Health service got reports on 69 milk caused epidemics. These resulted in 3,363 cases and 95 deaths. There were 1,189 cases of typhoid, 19 of paratyphoid, 1,518 of septic sore throat, 271 of scarlet fever and 24 of diphtheria. By contrast, in 1927, they found records of only 36 epidemics, causing 952 cases and 41 deaths. The distribution was 23 epidemics of milk-borne typhoid with 421 cases and 35 deaths; 2 epidemics of paratyphoid with 53 cases; 5 of scarlet fever with 398 cases and 5 deaths; 2 epidemics of diphtheria with 15 cases. The prevalence of milk-borne contagion in 1926 was much less than was that of ten to twenty years ago.—W. A. Evans in *The Chicago Tribune.*

TUBERCULOSIS OF THE TESTICLES WITH METASTASIS

Being in veterinary charge of some high-priced pigs imported from the United States, I had an unusual experience lately with a sick pig.

A Duroc-Jersey boar had been suffering four months from a severe inflammation of both testicles. All treatment was unavailing. When the affected organs were examined by palpation, various hard nodules could be felt. The animal evinced no pain when the testicles were compressed. Two of these nodules burst externally and discharged a thick creamy-like pus.

When the affection commenced, the board went without eating for ten days but soon after reassumed eating and retained a good appetite until time of its death. The general physical appearance was normal, although the animal did not put on fat. At the fourth month of illness I observed him coughing quite frequently and the respirations became dyspneic.

I decided to remove the testicles, not suspecting that I was handling a typical case of testicular tuberculosis. Both testicles presented nodules which when incised showed a cheesy or caseated condition and exuded a creamy-like pus. At the center of both testicles I found a big pus cavity which I presume was formed by several nodules becoming confluent.

The pig did not survive the operation and an autopsy was held. Both lungs and the pleura presented the tubercular lesions of pearl disease, cheesy infiltrations, cavities and nodules. A few tubercular foci were found in the liver and spleen. The peritoneum and intestines evidenced the pearly and nodular forms of tuberculosis.

It is my belief that in this case the bacillus of Koch was lodged primarily in the testicle, and then carried by the lymph and blood to other parts of the body; in other words, a metastatic infection.

The finding of tuberculosis in this pig necessitated the testing of all animals in the herd. The intradermal test was used. None of the animals gave a positive reaction, which lends support to the theory that the infection was primarily a testicular one and the extension to the lungs had been recent; since otherwise some of the animals in close association with this one would have been infected.

Juan Varas Catalá.

Rio Piedras, Porto Rico.

ANTIPHLOGISTINE IN ABDOMINAL INJURY

A Dandie Dinmont bitch was brought to me for treatment with history of having been run over by a touring car some months previously, with no apparent damage. On examination she showed much accelerated and labored breathing. Pulse hard and frequent. Temperature subnormal. On auscultation the lungs appeared to be normal. She showed great pain on pressure over the abdominal muscles, particularly about the right kidney region; however, she so tensed her muscles that satisfactory palpation was impossible. The urine appeared normal, as also were her feces. She was given sodium salicylate, gr.V every two hours until easier and local applications of tincture of belladonna Co. in soap liniment. The pain eased for two days, when it recurred with even more severity. At this juncture the animal was poulticed with Antiphlogistine. On removal of this poultice a most beautiful moist impression of the right ovary and right horn of the uterus, with part of the body and part of the left horn was shown—obviously the seat of inflammation and pain. Further poulticing eased the pain so much that operative measures have been postponed.

In this connection it is of interest to note how often an Antiphlogistine poultice will diagnose the seat of an internal inflammation for one; the moist spot definitely locating the seat of the trouble. —V. B. Jones, M.R.C.V.S., in *The Veterinary Journal*, London.

Arecolin Hydrobromid—Its Uses in General Practice*

By THOMAS B. CRISPELL, Parsons, Kansas

THE areca nut, or betel nut, is the fruit of a tall palm tree found and cultivated in the East Indies. It is strawberry shaped and approximately one inch in length. From it there comes four alkaloids, arecolin, arecain, aracaidin, and guvacain. Of the four mentioned, arecolin is the only one medicinally active.

Arecolin is a colorless, oily fluid. Its salts are crystalline and hygroscopic, except the hydrobromid, which is non-hygroscopic. Arecolin hydrobromid has a very general usage with veterinarians, but is little used by the medical profession.

Of the hydrogue cathartics, arecolin hydrobromid is less drastic than barium chlorid or eserin, but more prompt and efficacious than policarpin. Briefly, I shall mention cases in general practice wherein the practitioner wishes, or is compelled to quickly unload the intestinal contents, or to produce tone and secretions in an atonic digestive tract.

In digestive disturbances of the equine, where there is no evidence of complete obstruction, such as volvulus, intususeption, etc., and in flatulency in the horse, where there is an excessive amount of gas present, due to an indolent bowel; also in atony of the digestive organs following cases of overheat, wherein there are circulatory or secretory changes in the bowel, small doses of arecolin hydrobromid will quickly secure results, with accompanying increase of secretion, peristalsis, and passing of gas.

In forage poisoning, blind staggers, where the digestive tract contains the toxin, which is producing a cerebral disturbance, arecolin hydrobromid in large doses, with a corresponding dose of strychnin sulphate, will quickly rid the system of the cause, and produce a remarkable change in a period of minutes.

Equine choke is often relieved without any mechanical assistance by the use of small, continual doses of arecolin hydrobromid.

Certain cases of laminitis in the horse are often aborted or brought to a speedy recovery by the use of arecolin hydrobromid, to quickly remove the bowel content.

In the treatment of azotouria, tetanus, electric shock, etc., where the patient is prone to costiveness, small, repeated doses of this preparation will keep the bowel in proper condition, and rid the system of many toxins.

The bovine, with her many stomachs, is prone to consume dose after dose of oral medication, with apparently negative results. Hypodermic medications will quickly show a response by an increase of secretions, heart action, peristalsis, or whatever the practitioner may desire.

In engorgement of the rumen, where a rumenotomy operation seems imminent at any time, small, repeated doses of arecolin hydrobromid will, in the high percentage of cases, produce the desired results.

In "cow colic," or those severe griping cases of intestinal flatulence in the bovine, arecolin hydrobromid, in combination with other medicaments, will lead to a speedier recovery.

Frequently following parturition, some seven to twenty-one days, our well-fed, under-exercised bovine patients, exhibit a toxic condition, with a cerebral disturbance. These cases have a tendency in recuperation, toward a diminished glandular secretion of the intestinal tract. Arecolin hydrobromid in these cases,

*Presented at the thirty-sixth annual meeting of the Missouri Valley Veterinary Association, Omaha, July 8-10, 1929.

seems very beneficial, used in small doses, accompanied by strychnin sulphate.

Frequently we have presented to us, a cow, with a history of having been painful and "grunty" for several days. She has been given several pounds of magnesium sulphate. Eats very little. Grunts when she walks. Rumen contents feel rather solid, or doughy. These cases can be relieved, providing there is no metallic interference, with arecolin hydrobromid and strychnin sulphate, used hypodermatically every four hours. If the griping becomes too severe in these cases, alleviate it with f. e. belladonna.

In the sheep and goat, we find a wonderful field for the use of arecolin hydrobromid, as these animals do not take to the drenching bottle as kindly as their bovine sisters. The dosage of arecolin hydrobromid for the sheep and goat, is from 1/8 to 3/8 gr.

In canine practice all are acquainted with the uses of arecolin hydrobromid as a vermicide; hence I shall not discuss this subject, except to say that it is an efficacious remedy.

Lastly, but by no means least, we shall discuss the use of arecolin hydrobromid in auto-intoxication in the brood sow after farrowing. The owner usually informs us that the pigs are starving, sow cannot get up, and that she showed an excellent appetite the day she farrowed, or the day after. As a rule she was fed all she wanted. Some have diagnosed all of these cases as milk fever. I believe that a few could be diagnosed hypoglycemia, but the majority are an auto-intoxication, from overfeeding and constipation, coupled with some natural absorption from the uterus. The following treatment will save a very high percentage of them. Administer a high enema. Give hypodermatically 1/2 gr. of arecolin hydrobromid. Give an Aloetic Bolus. Provide moisture to cool the body, if necessary, but do not allow chilling to occur. Some of these sows may be very stiff and sore for a week or ten days; but they will recuperate nicely in time.

Summing up the uses of arecolin hydrobromid, it is by all means the leader of all hydrogue cathartics. It should not be used in low vitality subjects, or those with respiratory disturbances. In case of toxic symptoms, administer atropin sulphate as an antidote.

The dosage found to be safe, but efficient, by constant use in general practice, after taking into consideration species, age, condition, mode of administration, and ailment, is as follows:

Horses, from 1/8 gr. to 1 gr.
Cattle, from 1/8 gr. to 1/2 gr.
Sheep, from 1/8 gr. to 3/8 gr.
Swine, from 1/8 gr. to 1/2 gr.
Dogs, from 1/8 gr. to 1 gr. (orally).

BROOM HANDLE REMOVED FROM ESOPHAGUS OF COW

One hot night I was called about 12 miles from the office to attend a cow that was said to have been choked. Upon my arrival I found a very nice cow showing the following symptoms. Difficult respiration, groaning, restlessness, marked emphysema of the fore quarters and portion of the neck. Examination disclosed the end of a hard object, about 14 inches anterior to the sternum, which was apparently in the esophagus, the distal end of the foreign body was somewhere back in the chest cavity.

Diagnosis: rupture of the lungs and perhaps the trachea.

Prognosis: decidedly unfavorable.

Upon closely questioning the owner I learned that they had been trying to force some obstruction down the cow's esophagus with a broom handle and after numerous attempts just when everything seemed going right the cow gave a sudden lurch and threw herself and the broom handle broke off.

The owner was of the decided opinion that unless the broom handle was removed he would lose a cow and I being unable to convince him that the end would be the same if it were removed;

it was decided we would operate. With the aid of my auto headlights, which threw a good light every where except where it was needed, a lantern and a kerosene lamp the cow was cast, tied and held in a partial dorsal position with the operative field uppermost and the head well extended. The skin was disinfected and an incision about four inches long was made over the jugular groove. The scalpel was then laid aside and by blunt dissection and pushing the blood vessels aside the hard end of the broom handle could be felt in the esophagus. An incision was made directly over and onto the foreign body which was removed with a pair of tumor forceps. Ordinary artery forceps would not budge it.

The broken end of the broom handle measured 18 inches in length. The wound was sutured loosely and a dry dressing applied.

Results: the cow died 36 hours later. It took a much longer time than this for the mosquito bites to heal on me. There must have been about a million mosquitos and about four times this number of flies present while the operation was in progress.

Richmond, Va. H. T. Farmer.

PEMPHIGUS IN A COW

A farmer came to my office and told me of a young milk cow which had a breaking out on the udder. I guessed cow pox, and prescribed Fowler's Solution, and a carbolized ointment for the udder. A week later the owner returned and stated the cow was no better. I told him to continue the treatment.

After the elapse of another week I was called to see the animal. I found the udder with ulcerative dermatitis covering the entire organ and adjacent skin on the leg. The entire body showed scattered "pox." The base of the tail was ulcerated. These ulcers contained a great deal of pus. There was an edematus swelling on the right forearm which had broken and emitted a pustular exudate.

A VETERINARY ASSOCIATION HOME

The above photograph was taken during the recent meeting of the Missouri State Veterinary Medical Association in Sedalia, and shows the building put up by the Association at the State Fair Grounds. The building contains a large auditorium, an office for the Association, an office for the state veterinarian, and a number of bedrooms on the upper floor. The men shown in the picture are some of those in attendance at the state meeting, June 25-27, 1929.

The right parotid gland was greatly enlarged and very solid. The left jaw had a very hard swelling about the size of an egg.

Temperature 100° F., respiration about normal, appetite good.

This cow is negative to the tuberculin test. What ails her?—A. R. B., Indiana.

"WORM EXPELLERS" MUST BE LABELED CORRECTLY

"No drug or mixture of drugs known at the present time can be truthfully offered to the public as an expeller or vermifuge for all types of worms which infest poultry and other animals," according to an official regulatory announcement recently issued by the Food, Drug, and Insecticide Administration, of the United States Department of Agriculture.

"The unqualified use of the terms 'worm expeller' and 'vermifuge' in the labeling of these drugs constitutes a misbranding under the Federal food and drugs act unless the name of the specific worm or worms is used for which the preparation is known to be effective."

FUN AT THE E. I. V. A. PICNIC

The competition furnishing the most excitement at the Eastern Iowa Veterinary Association picnic at Vinton, July 9th, was the base ball game played by the Blonds and the Brunettes. The Blonds won. The losing team is shown above. Their spirits seem not to have been dampened by getting the booby prize—all-day suckers. From left to right they are: Mrs. C. B. Strain, Dunkerton, 2b; Mrs. G. C. Bevan, Maquoketa, lf; Mrs. R. E. Elson, Vinton, 1b and capt.; Mrs. W. S. O'Brien, Ryan, p; Miss Lorraine Glenn, Norway, p; Mrs. R. R. Dappen, Brooklyn, ss; Mrs. J. C. Glenn, Norway, lf; Mrs. T. J. Gilloon, Dyersville, rf; Mrs. R. M. Hofferd, Fairfax, c; Mrs. T. J. McCabe, Victor, 3b. The winning team comprised: Captain, Mrs. L. W. Kellogg, Anamosa; Mrs. P. V. Neuzil, Blairstown; Mrs. Guy Hershey, Cedar Rapids; Miss Dorothy Campbell, Chicago; Mrs. L. W. Marner, Wellman; Mrs. F. J. Crow, Iowa City; Mrs. A. R. Menary, Cedar Rapids; Mrs. A. H. Quinn, Des Moines, and Mrs. I. W. Moranville, Durant.

A PERFECT SCORE FOR A BIOLOGICAL PREPARATION

In the Panama Canal Zone, where the population now stands at about 37,000, not a case of smallpox has ever developed. The requirements are that incoming residents must show evidence of successful vaccination within 5 years; that infants must be vaccinated at 3 months of age; that children must be vaccinated upon entering school and at 5-year intervals thereafter, while in school. These requirements are strictly enforced and that leaves the Zone absolutely free from smallpox.—*Illinois Health Messenger.*

Within the past 10 years more than 30,000 cases of smallpox have occurred in Illinois. These cases cost the state health department more than three-quarters of a million dollars and required a total of more than 3,500 years spent in quarantine by the patients and care-takers.

The recent occurrence of an unrecognized pathological condition in cattle heavily tick-infested in San Benito County, Calif., has resulted in the demonstration of natural tularaemia infection in adults of the Pacific coast tick, *Dermacentor occidentalis* Newmann. This finding is of importance, because this tick, which is common in many sections of California and in southwestern Oregon, is a frequent parasite of man, and, hence, an apparent potential source of human tularaemia infection. It has also been reported in horses, cattle, deer, dogs, sheep, and rabbits.—*U. S. Public Health Reports.*

ROUP AND PARASITISMS OF FOWLS

About a year ago De Saint Moulin published [1] the results of a study of coryza in a flock of 1,500 pigeons. His conclusions are:

"Coryza of pigeons is not a variety of some diphtheritic infection; nor is it due to the pyogenic bacteria commonly found in the upper air passages of pigeons. It seems to be closely related to parasitism of the intestine and to coccidiosis. Birds affected should be given anti-parasitic treatment and their habitats disinfected thoroughly."

The question of the relationship, if any, of the common coryzas of chickens to parasitic infestation was submitted to E. A. Benbrook, professor of veterinary pathology in the Iowa State College, and to C. A. Brandley, poultry bacteriologist in the Kansas State Agricultural College. Their replies follow:

We have not noted any specific connection between parasitisms of poultry and roup, although we are firmly convinced that parasitism is a very important factor in infections of a secondary nature.

During the year 1928 we had the opportunity of examining 3,010 chickens sent to this laboratory for diagnosis. The following figures in connection with these birds will give an idea of the types of diseases we are diagnosing:

Roup	43
Caecal worms	147
Capillaria worms	2
Coccidia	455
Air sac mites	5
Entero-hepatitis	18
Round worms	199
Tape worms	338

E. A. Benbrook.

Ames, Ia.

It seems that the term coryza is rather loosely applied and usually does not indicate a specific disease. We interpret it as indicating an acute inflammatory condition involving the mucosae of the head.

Our observations at this station on the relation of intestinal parasites to coryza in fowls do not coincide with those on pigeons by De Saint Moulin.

Although we have found that a large proportion of birds showing intestinal parasitism of various degrees manifest a simultaneous coryza or cold, we have examined quite a large number of cases with coryza that were intestinal-parasite-free on macroscopic and microscopic examination.

Approximately 75% of the fowls (not including chicks less than one week old) reaching our laboratory during the past two years showed intestinal parasitism of some degree. However, many of the parasite infested cases did not show a perceptible coryza, nor was coryza absent in all the parasite free birds. On the other hand, numerous cases of light intestinal parasitism showing coryza, revealed on autopsy, lesions and etiological factors that obviously were of more pathologic significance than the intestinal parasites and therefore more probably causes of coryza. It is of course seldom possible to determine in many of these cases if coryza preceded the chief disease factor.

The presence of coryza in birds free, as well as those harboring intestinal parasites, necessitates, in our opinion, the consideration of other factors that tend to predispose the birds to coryza—namely, crowding, drafts, damp and poorly ventilated houses, unsanitary conditions, lice and mites, and inadequate feed.

In considering the important relation of the diet to health, we must consider the part an inadequate ration may play in coryza. In experimental as well as field cases of avitaminosis, particularly avitaminosis A., coryza precedes and accompanies the typical ophthalmia of this disease. In intestinal parasite-free as well as infested birds suffering from a lack of vitamin A, the nature and severity of the coryza is very similar.

As no mention is made of the probable role of the diet in coryza in St. Moulin's experiments with pigeons, one is inclined to doubt if they are complete or significant.

C. A. Brandly.

Manhattan, Kans.

[1] *Annales de Médicine Vétérinaire* Vol. 73, No. 3; abstracted in *Veterinary Medicine*, Vol. XXIV, No. 2, pp. 81-2.

Eradication of Pullorum Disease

By W. R. HINSHAW, Amherst, Mass.
Department of Veterinary Science, Massachusetts Agr. Exp. Station

A COMMON mistake made by many laboratories aiding in pullorum disease (bacillary white diarrhea) control or eradication programs, is that of testing infected flocks only once annually. Why this procedure has been substituted for the natural method of eradicating any infectious disease, namely, that of an intensive retesting program, is not known; but herein lies one of the chief reasons for failure to eliminate pullorum disease from infected premises.

The experience of the author has been the pullorum disease can be eliminated from infected flocks in a single season if the complete co-operation of the poultrymen can be secured. Furthermore, it matters little whether the initial infection is 35% or 2%. By making the original test on the flock when the birds are four to five months of age, removing the reactors, cleaning and disinfecting the houses, and then retesting the entire flock every month or six weeks until a non-reacting test is obtained, the disease can usually be successfully eliminated after from two to five retests. The number of retests will depend on the virulency of the strain of S. pullorum infecting the flock and upon the kind of management, as much as upon the efficiency of the test, if the latter is made by properly trained technicians.

During the past two testing season 22 Massachusetts flocks (16,558 birds) which have been successfully made non-reacting in one season by the repeated use of the agglutination test (diagnostic titre of 1-25) and the co-operation of the poultrymen, had a total of 1,203 reactors and 1,068 of these were found in the original test.[1] Thus 90.28 per cent of all the reactors detected in these flocks were determined at the first test. Therefore, under average conditions one can expect to detect about 90 per cent of the infected birds by the original test. The remaining 10 per cent should not be misconstrued to indicate that all were diseased at the first test, but not detected. Pullorum disease is of an infectious nature and the causative organism must be removed from the premises before eradication will be accomplished. As long as infection exists on the premises, birds will continue to become diseased, and monthly tests will remove these and prevent further spread of the disease, and thus, finally aid in its complete elimiination from the premises.

Some investigators maintain that many of the reactors detected among birds that have not matured will become non-reactors, and therefore advise waiting until all birds are fully matured, and all females laying before testing. However, from the standpoint of eradication a small percentage of such reactors should be sacrificed, since they are nearly always questionable, and therefore dangerous birds to have in the flock. Furthermore, it is a generally accepted fact that pullets just starting to lay are likely to lay eggs on the floors, dropping boards, etc. In addition, a large number of soft-shelled eggs are laid on the dropping boards during the night and early morning. Leaving infected birds in the flock until they start to lay, increases the chances for infection to spread because of the infected eggs laid by such birds. These infected eggs, if eaten by healthy birds, are one of the most important means of transmission of the disease.

Poultrymen should be advised to wait until at least one non-reacting test has been secured before starting to save hatching eggs. If a poultryman cannot

[1] "Eradication of Pullorum Disease in Massachusetts," Hinshaw, W. R., Sanders, E. F., and Dunlap, G. L., Massachusetts Agricultural Experiment Station Control Bulletin No. 48.

afford to test an infected flock under an intensive retesting program, he should be advised to buy replacements as hatching eggs or day-old chicks from known tested and disease-free sources. If either plan is followed one should not be surprised to find a small percentage of infection when the flock is tested the following fall. This will be especially true if much infection existed in the original flock, and if proper precautions regarding cleaning and disinfection have not been observed. Therefore, it may require two years to completely eradicate the disease.

Whether or not a poultryman can afford to follow a retesting program such as is outlined, will depend on several factors. If he is an excellent manager, has suitable equipment (houses and yards that can easily be cleaned and disinfected, etc.), and has a breeding flock which he cannot replace except by years of work, he can by all means afford to retest his flock until free from Pullorum disease. On the other hand, if he has an average flock, dirt floors in the houses, and is a poor manager he should be advised to buy disease-free stock each year, rather than attempt to raise his own stock. Once a poultryman has a disease-free flock, he should be advised to test every bird on the premises annually, if he is going to raise his own stock or sell hatching eggs or day-old chicks.

Some of the common causes for failure of poultrymen to eradicate pullorum disease are summarized below:

Failure to test all birds on the premises annually.

Failure to retest infected flocks at monthly intervals until a non-reacting test is obtained.

Failure to remove reactors promptly, and to clean and disinfect the premises thoroughly.

Failure to burn offal from reactors kept for home consumption.

Keeping reactors on the premises for egg producing purposes.

Feeding uncooked eggs from unknown sources.

Custom hatching for flock owners who do not have disease-free flocks.

Buying replacements from diseased sources.

Returning birds to flocks from shows, fairs, etc., without first quarantining and testing.

The principles of eradication of pullorum disease outlined in this paper are applicable to any testing method used. As has been mentioned before, probably the most important factor in eradication is that of retesting a flock until it is non-reacting. In sections where there are few, if any, pullorum disease-free flocks, veterinarians should concentrate their efforts to get outstanding poultrymen interested in cleaning up their flocks in order to have disease-free sources of

replacements. If greater effort were concentrated on establishing disease-free sources of replacements in a few sections of each state rather than attempting to test every flock in every community, pullorum disease eradication could be accomplished very much more rapidly. Poultrymen who buy hatching eggs and day-old chicks, should be cautioned to buy from hatcherymen who not only have tested stock but stock that has passed at least one non-reacting test. Replacements from sources which have merely been tested and reactors removed are probably a better buy than replacements from untested sources, but not as safe as from disease-free sources. If disease-free stock is not available, flocks that have been retested two or more times should be recommended in preference to flocks tested only once during the season.

Important Diseases of Poultry—Their Recognition, Treatment and Prevention*

By CHAS. MURRAY, Ames, Iowa
Department of Veterinary Investigation, Iowa State College

FOR the past several years no class of live stock has given returns on capital invested to compare with poultry. The result has been that owners of this class of live stock have come to a realization of the importance of maintaining the health of the flock and avoiding losses from disease to which little attention was paid a decade ago. Under the impetus of liberal returns from the poultry industry an incentive to increase production has resulted, and the attempt has not been accompanied by a corresponding effort to increase the physical equipment essential to successful poultry raising. This has resulted disastrously in some cases and is a probable reason why there has not been a large over-production with accompanying lowering of prices.

A New Demand for Veterinary Service

Due to this aroused interest in a major industry, demands are made as never before upon the veterinarian for advice and treatment, thereby opening up a profitable field for his efforts. The call for help in diagnosis has been mainly to the state and private laboratories and to extension workers and county agents. This, in our opinion, is not for the best interests of either the poultryman or the veterinarian. More effective, immediate help can be rendered by the competent veterinarian in the field than by the man in the laboratory.

The history of the diseased flock as given by the owner is usually far from complete. He is inclined to overlook any faults in management or at least to fail to mention such in his description of his trouble. He rather is inclined to enlarge upon the excellent care his birds have received and to attempt to free himself from any responsibility for his troubles. The veterinarian unbiased in this manner, and with a proper knowledge of poultry management and poultry diseases, may by personal investigation see at once what the trouble is and may by sound advice check the same by removing the cause. This we believe is the veterinarian's task.

If laboratory help in diagnosis is necessary the veterinarian is the logical one to call for it, since upon him, finally, should rest the responsibility of application of preventive or curative measures. A valuable service may thus be rendered the community and an enlarged field of practice created to his own advantage. Diagnosis of poultry diseases, as in no other class of domestic animals, is dependent upon the history of the flock. One needs to know the age of the birds, the method of management, the symptoms manifested by many rather than by a single bird, the extent of the disease in the flock and the rate of mortality. All of these supplement the autopsy findings in a way to make possible an accurate diagnosis.

Control of Poultry Diseases Complicated

The control of poultry diseases presents a problem more complicated than that of any other class of live stock. The spread of an infectious disease through the flock is rapid and complete, especially if poor sanitary conditions exist, as is so often the case. The fowl's resistance to those diseases to which it is subject is apparently very low. The percentage of recoveries is likewise low. The close association of individuals of the flock favors the spread of any infection. It must be realized then how important is preventive treatment. The value of a single bird will

* Presented at the semi-annual meeting of the Minnesota Veterinary Medical Association, University Farm, St. Paul, July 10-11, 1929.

not warrant the nursing and treatment that would be given a more valuable animal. Curative treatment, therefore, if indicated at all, is a flock treatment rather than an individual treatment. Fortunately fowls are not so discriminating in their taste for food as are other animals. They will accept medication through drinking water or food and administration of many drugs is readily made in this way.

Healthy Stock

Health of poultry is in large measure dependent upon the selection of good vigorous stock that has not had nor been exposed to any infectious disease. So far as certainly known there is but one disease that is transmitted to the chick through the egg from the infected hen. This is bacillary white diarrhea (pullorum disease). It is evident, therefore, that those who depend upon newly hatched chicks for replenishment of their flocks have a source of supply that is practically safe, so far as the introduction of diseases other than bacillary white diarrhea is concerned. By purchasing properly incubated day-old chicks from bacillary white diarrhea free stock only, there need be little concern about the introduction of any disease into a disease free flock.

The purchase of adult stock for breeding, on the other hand, presents a problem. Apparently healthy birds may be carriers of the germs of the communicable diseases such as tuberculosis, cholera, fowl typhoid and the like, as well as intestinal parasites such as worms and coccidia. Detection of such carriers is often impossible. Except for bacillary white diarrhea and tuberculosis there are no reliable tests which may be applied to detect carriers of disease. The purchaser must depend entirely upon the history of the flock from which his purchases come to guide him in the selection of safe, disease free birds.

It is always advisable to keep newly-purchased stock, or that which has been returned from shows, fairs, egg laying contests, etc., in quarantine for several weeks before placing it in the home flock. This gives time for the appearance of such diseases as cholera, typhoid, flu and other acute infections, and exposure of the home flock may thus be prevented.

Visitors a Source of Danger

An all too common method of spreading infectious diseases is by visitors to the flock who may have come from other flocks where diseases are present. A poultryman should never permit a buyer of poultry, a peddler of remedies or a culler to visit his poultry houses or yards without disinfecting his shoes or slipping on a pair of overshoes provided for him. Veterinarians, extension poultry men and official inspectors are aware of the danger of carrying infection in going from one flock to another and will exercise proper precautions against the spread of disease in this manner.

Effect of Soil and Drainage

Soil and drainage are important factors in maintaining the health of the flock. Even the most carefully managed plant, particularly the range, may became contaminated with the germs of disease. To keep such danger to a minimum, strict attention to cleanliness must be observed. A fundamental law of sanitation is that no animal can long exist in constant and close contact with its own excrement without incurring the hazard of an attack of disease.

The upper portion of soil in long used, or overcrowded, poultry lots eventually becomes nothing more nor less than sewage, as can readily be detected by walking through such lots after a heavy rain. Since it is in bodily excrement that the germs of many of the most serious poultry diseases are carried, there becomes at once apparent the reason why clean ground is the key to successful poultry raising. Heavy soil or level ground should be artificially drained. Rolling soil aids drainage and should be selected as the site of the poultry plant whenever possible. Avoid heavily shaded soil. A grove is a poor poultry range. Shade trees, if present, should be well apart to permit easy cultivation and the maximum of sunlight. The latter is the only effective disinfectant agent for soil. Chemical disinfection is impractical if at all possible.

Effect of Malnutrition

It is common opinion that birds fed a deficient diet are more subject to infectious diseases than those properly fed. Insufficient experimental work has been done to prove or disprove such opinion, but field observations seem to warrant the advice to feed a complete ration in order to avoid such possible danger. The food elements essential to good health, which are most often lacking in diet, are the minerals and vitamins. For proper utilization of the former, direct sunshine is essential. During the housing season, when sunshine is least available, cod liver oil is fed to supplant the sunshine.

The minerals most important are calcium, which is supplied by limestone and oyster shell, and phosphorus, which is supplied by bone meal. The most important vitamins are supplied by milk, green feed and cod liver oil.

A heavy producing flock of hens will often go off their feet in late winter, showing symptoms of paralysis. Quite often the cause of such condition is the lack of sunshine and the addition of two pounds of cod liver oil to 100 pounds of the mash ration will usually correct it if the cause is as above suggested. It should be borne in mind, however, that there are other causes of paralysis than the one mentioned, and that for such, cod liver oil is of no effect.

Poultry House

The house should be constructed with the thought in mind to afford comfort to the flock, easy cleaning, adequate ventilation and the maximum of sunlight.

Some Suggestions for Controlling Infectious Diseases

1. Sick birds are a source of danger to the entire flock unless removed. Early removal of the first case of an infectious disease will often check its spread. The bird removed may be placed in isolation or killed and burned. The latter is preferable.

2. The litter and droppings in a house where disease has appeared should be removed and burned or be spread on ground not accessible to poultry. If the weather is favorable the house may well be disinfected.

3. If diseased birds are handled the hands should be washed in an antiseptic solution before healthy birds or feed are handled. If sick birds and healthy are to be cared for by the same attendant, care of the healthy should be first. If possible, have a special attendant for sick birds.

4. Avoid going, without change of shoes, from a house where sick birds are present to one where the healthy flock is kept. A pair of boots or overshoes kept in the house where sick fowls are being cared for may be worn while in that house.

5. Never spill the blood or the body fluids of a sick bird on the floor of the poultry house or on the soil of the yards. If a bird is to be destroyed do it by dislocating the neck without breaking the skin. "Use the ax" is an excellent slogan, but use it figuratively only. Do not hold or permit to be held a post-mortem examination in the yard or house. Perform it in a place not used by birds and over newspaper or cloth that may be taken up with the bird and burned.

The Commoner Diseases

The diseases affecting fowls are numerous, but a large proportion of the losses sustained are the result of a few diseases, and it is of these we shall briefly speak.

The pathological conditions affecting the head and respiratory system of fowls, variously known as colds, catarrh, roup, canker, fowl diphtheria, chicken pox, etc., have been the subjects of considerable study by many investigators and the common opinion now held is that they are of varying etiology. Beach of California, basing his opinion upon the results of his own and other investigations, proposes a classification of these diseases which appeals to us as a reasonable one.

Chicken Pox or Contagious Epithelioma

Beach defines chicken pox or contagious epithelioma as a readily transmissible disease, manifested by the formation of small wart-like epithelial tumors on the comb, wattles or skin of the head. The cause of this condition is a filterable virus. This was proved first in 1902 by Marx and Sticker, who demonstrated that the virus was pres-

ent in the filtrate from suspensions of the tumors passed through porcelain filters.

Canker or Avian Diphtheria

Avian diphtheria or canker is described by Beach as a condition manifested by the formation of masses of adherent, cheesy exudate on the mucous membrane of the mouth or eyes. He does not regard these diphtheritic lesions as necessarily evidence of a specific infection, since factors other than the filterable virus of contagious epithelioma are known sometimes to produce them.

The Coryzas

Colds, catarrh and roup, Beach describes as manifested by a viscid discharge from one or both nostrils which has a tendency to collect in the nasal sinuses where it undergoes rapid transformation into a cheesy mass, causing marked swelling of the infraorbital sinuses. Such lesions, as in the case of canker, are believed to be due to a variety of causes. It is to be recognized, however, from both experimental and clinical evidence that chicken pox which affects the skin and the commonest form of canker or diphtheria which affects the mucous membranes are caused by the same etiological factor; viz., a virus. Carnworth in 1908 produced a diphtheritic disease of the mucous membranes by inoculation with pure pox material from the comb, and chicken pox with diphtheritic material from the mucous membranes. These cross transmission experiments were later confirmed by Bordet and Fally, Uhlenhuth and Manteufel as well as others.

Differentiation of Types of Canker

Beach, in justification of his claim that not all diphtheria or canker is due to virus, proposes a classification of canker as follows:

(a) Chicken pox canker due to the virus.

(b) Mechanical canker due to injury of the mucous membrane of the mouth, particularly of the cleft palate, and inner canthus of the eye as the result of the lodgment of a particle of litter or grain. Removal of the cause results in rapid recovery.

(c) Malignant canker, which commonly occurs at the base of the tongue or the wall of the larynx, is usually not amenable to treatment and highly fatal, but shows little tendency to spread through the flock. Both these latter forms occur sporadically.

Control of Diseases of the Head

In all of the foregoing diseases rigid sanitary measures play an important part in checking the spread. Early isolation of diseased birds, destruction of the dead, and scrupulous cleanliness of quarters and the thorough disinfection of the same and of the feeding and drinking utensils will accomplish much. Of great importance, too, is avoidance of overcrowding. Housed in winter quarters the heavier breeds should be provided with 4 square feet of floor space per bird; the lighter breeds with 3½ square feet.

The latent character of the disease necessitates the frequent examination of the mouths of the flock in order to detect early the presence of the disease.

Treatment of Diseases of the Head

Flock treatment is highly unsatisfactory. The owner longs for a specific which may be placed in the drinking water, the use of which will eliminate the trouble. There is no such specific, and only by individual treatment of the birds affected can satisfactory results be anticipated.

The early application of silver nitrate or tincture of iodin to the pox nodules may serve to abort these and their spread may be largely restricted. The removal of the diphtheritic membranes and the painting of the raw surfaces with the same chemicals are of great value. In our own experience we have accomplished much by the use of glycerin containing 0.5% iodin. This is prepared by adding to the glycerin the proper quantity of iodin crystals and heating the mixture until the iodin is in solution. In catarrh and roup the eyes and nostrils should be washed with a mild antiseptic such as 10% argyrol or 50% hydrogen peroxid, and after thorough cleansing should be anointed with mentholated vaseline. Silver nitrate also recommends itself for use in the eye. The diet of the birds should be a laxative one of ground

feeds with little whole grain and plenty of green food.

The Use of Biologic Agents in Prevention

Immunization against pox and diphtheria was accomplished by Manteufel, who injected a saline suspension prepared from the scrapings of the epithelioma or the mucous membranes. Birds thus injected showed immunity to subsequent infection for as much as two years.

In 1913 Hadley and Beach, using Manteufel's method, reported successful immunization of fowls against pox.

In 1915 Mack and Records in Nevada and Beach in California reported success with Manteufel's method.

Brumley and Snook of Ohio in 1916, while recognizing that pox and diphtheria are primarily due to a virus, felt that the secondary invaders produced severe complications and that by controlling these secondary organisms the primary disease might be better controlled. Their efforts by the use of bacterins were reported as very successful. The writer's own experience with bacterins, Brumley and Snook's method, on a considerable number of controlled experiments of this character has been entirely unsatisfactory.

Several hundred birds in infected flocks, in which probably twenty per cent were infected, were divided equally into lots containing as nearly as possible the same number of birds of equal degree of infection. One lot was vaccinated with an autogenous bacterin, the other was untreated. The same sanitary measures were inaugurated in the two lots. After the disease had checked it was found that in the treated flock two more birds had died than in the untreated.

McNutt and Murray conducted later experiments in flocks consisting of 670 birds. Commercial mixed bacterins recommended by their manufacturers for the prevention and treatment of cholera and secondary infections of chickens, including canker, pox, roup, etc., were used. In every flock treated the losses of treated birds equaled or exceeded the losses of the untreated.

In another series consisting of 394 birds, pox-virus vaccine was used as a prophylactic in the late fall. An outbreak of pox and canker occurred during the winter and the disease was as prevalent among the treated as among the untreated chicks. The death rate was greater in the untreated birds but the difference was slight—one bird more per hundred.

Recent work reported by Sawyer of Washington State, records promising results with a glycerinated pox-virus vaccine applied to feather follicles, a method developed in Holland.

J. R. Beach also reports the use of a "new vaccine" by the feather follicle and subcutaneous methods with results differing but slightly in the two. The vaccine differs somewhat from the old in method of preparation, but contains living virulent pox virus. No value as a curative agent for sick birds is apparent. As a prophylactic agent it is promising. Apparently the best that can at present be said concerning vaccination of poultry for the diseases above mentioned is that such practice is yet in the experimental stage.

Avian Tuberculosis

Following the experimental work of Van Es, Graham and others, which indicates that much of the tuberculosis of swine retained by inspectors at packing houses is of avian origin, an added responsibility rests upon veterinarians in the eradication of this disease from the poultry flocks. The symptoms and lesions of avian tuberculosis are well recognized by veterinarians and specimens for autopsy are abundantly available. Recognition of infected birds of a flock is possible by the tuberculin test which, with improved avian tuberculin and improved technic of administration, now approaches in reliability other varieties of tuberculin as a diagnostic agent.

The veterinarian's problem is to decide whether tuberculin testing of all kinds of flocks shall be the rule or whether discrimination in choice of flocks shall guide him. Until more experimental work has been done and the results of local or area testing of fowls are better known, it appears advisable to follow a conservative program with rec-

ommendations based upon present limited data. The fact that tuberculosis is observed chiefly in old fowls warrants our recommending to poultrymen the practice of keeping only young birds in the breeding flock and against the practice of keeping birds of two years of age or over.

The cost of tuberculin testing must be kept in mind and it is questionable whether the ordinary, unimproved flock has a value to warrant its application. It rather would seem advisable to recommend that such a flock be disposed of at the end of the profitable laying season to be replaced by better stock hatched or purchased as day-old chicks and raised on clean ground entirely separate from adult birds. After disposal of adults a thorough clean-up and disinfection of houses and equipment with cultivation of lots should render the premises safe for the growing stock when it is time to remove them from summer range to winter quarters.

In the valuable purebred flock tuberculin testing is certainly to be recommended. If the percentage of reactors is low, semi-annual testing for detection of reactors and proper sanitation are to be recommended. If the percentage of reactors is high (40-60%) such flocks are best handled as suggested for the ordinary, unimproved flock.

Fowl Cholera

The most prevalent enteric diseases of poultry are fowl cholera, fowl typhoid, bacillary white diarrhea of chicks and coccidiosis.

Fowl cholera is a highly fatal disease of birds caused by the *Pasteurella aviseptica,* an organism of the hemorrhagic septicemia group. It is to be classed as a wet season disease, being most prevalent in spring and fall. It may be manifest in either chronic or acute form. The former is less easily recognized.

Chronic Type.—The chronic nature of the fowl cholera may be due to a low degree of virulence of the causative organism; to a high degree of resistance of the members of a flock or to localization of the infection. The latter is observed often in the joints, producing an arthritis, or in the wattles producing a characteristic edema. The latter is most often noted in breeds of fowls with heavy and pendulous wattle development like the Leghorns, Anconas and Minorcas. Typical bipolar organisms may be recovered from such cases, in some instances possessing sufficient virulence to produce septicemia when injected into susceptible birds. The organisms recovered from cases of arthritis may likewise produce septicemia when injected. Cases of this type of infection, then, should be early removed from the flock and preferably destroyed in order to avoid a possible outbreak of septicemic fowl cholera.

Acute Type.—Acute fowl cholera is characterized by sudden onset, quickly fatal termination, cyanotic combs, diarrhea and hemorrhagic condition of the mucous and serous surfaces.

The treatment, both with drugs and biologics is unsatisfactory. Institution of strict sanitary measures, avoidance of overcrowding and proper diet are valuable.

Medicinal treatment of birds already affected is useless, but the uninfected members of the flock merit special treatment. A physic with magnesium sulphate, one pound to 100 or 125 birds, is indicated as flock treatment, or better still, calomel in 1-grain doses in capsule or tablet administered individually. Antiseptics such as 1 to 5,000 bichlorid of mercury, potassium, permanganate 14 grains to the gallon, sulphocarbolates, etc., may be used in drinking water. Their action is to destroy the bacteria gaining entrance to the water from infective discharges, thus limiting the spread of infection. Experiments by Eriksen at Mountain Grove, Missouri, indicate that these reagents really possess merit in limiting the spread of infection.

Biologic treatment in the form of bacterins of the Pasteurella organism or mixed bacterins of this and associated groups are lauded by some but condemned by others. Gallagher of the U. S. Department of Agriculture, J. R. Beach of California, and Van Es and Martin of Nebraska all report results with fowl cholera bacterins as unsatisfactory or without value. Mack and Records of Nevada, the Kansas Experiment Sta-

tion and others report good results. Our own experience with both bacterins and aggressins has failed to show these products possess any value either as prophylactic or curative treatment.

Most certainly bacterins cannot be expected to give favorable results unless accompanied by careful sanitary measures and like bacterins for roup and related diseases must be considered at present in the experimental stage.

Fowl Typhoid

Fowl typhoid is primarily a disease of growing chicks occurring most commonly in such stock on range at broiler size and larger. Unlike cholera, it is a dry weather disease, occurring in this and surrounding territory in late summer. It may be of acute or chronic type, more frequently the latter. Birds affected may become emaciated and anemic except in the acute form which resembles cholera. A differentiation of these diseases by autopsy is often difficult. One outstanding evidence of fowl typhoid is the appearance of the liver which is enlarged and of a bronze color. Laboratory examination is frequently required for differentiation.

The treatment of fowl typhoid is the same as for cholera and the results are quite the same. Bacterins for this disease appear to offer greater promise than for cholera.

Pullorum Disease

Bacillary white diarrhea, proved by Rettger in 1908 to be a disease of specific etiology affecting young chicks and later as also affecting adults, from which it is transmitted through the egg to newly hatched chicks, without doubt causes the greatest loss in number of chicks of any of the infectious diseases. Its wide distribution has undoubtedly been favored during the past few years by the extensive traffic in day-old chicks hatched from infected hens or infected through exposure in incubators. Like infectious abortion disease of mammals its manifestation in adult stock is not characterized by any changes that make it readily recognizable.

The detection of bacillary white diarrhea by the agglutination test is highly reliable and it is by such test that encouragement for its eradication is extended to the poultryman. Numerous states, particularly in the east, have been applying this test for several years, in an effort to control the disease, and the fact that such effort is being continued indicates that results justify it. Further research in perfection of the test as applied in this disease is essential before results will be entirely satisfactory and it is gratifying to note that such work is being pursued at this (Minnesota) station.

Until the test has become general enough to establish bacillary white diarrhea free flocks in sufficient numbers to supply the demands of poultrymen for breeding stock or hatching eggs, we are forced to rely upon selection and sanitary measures to limit the enormous loss now being sustained. For selection we may recommend to the poultryman the purchase of eggs from flocks of good history and known low mortality of newly hatched chicks.

While it is apparent there are no specific measures that can be applied in combating the infection, good management is very helpful. This includes proper incubation, proper brooding, proper feed and avoidance of overcrowding.

The work of Hinshaw and others at Manhattan in their study of transmission of bacillary white diarrhea at hatching time in different type incubators indicates that a marked effect in control of the spread of the infection is exercised by maintaining a high degree of moisture in the machines at hatching time. Hatcheries that are following this plan this year report far fewer complaints of losses from their customers.

The practicing veterinarian is frequently called upon to pass judgment upon young chicks presented him by hatcherymen or poultry raisers. He may be helped in his diagnosis by bearing in mind that in bacillary white diarrhea death usually begins within three or four days after hatching, although delayed infection may become apparent in chicks two weeks or more of age. The mortality is rapid and heavy with an average above 50%.

The antemortem symptoms do not enable one to distinguish the bacillary type of the disease from diarrhea due to other causes. Postmortem observations include an ocher colored liver or a yellowish-brown one streaked with hemorrhages. Unabsorbed yolk in the abdomen, while not necessarily diagnostic, is significant, particularly if the yolk content is soft, abundant and yellowish-brown or greenish colored. Necrotic foci in the lungs are of very common occurrence, indicating a respiratory infection. These latter lesions, formerly diagnosed as aspergillosis, will be found to contain the *Salmonella pullorum.*

The pullorin or wattle test applied like tuberculin to adult birds has come into considerable use in the past few years but as now conducted is considered less reliable than the agglutination test.

Coccidiosis

Coccidiosis caused by a minute protozoan parasite is becoming every year more prevalent. It most commonly affects birds of from 6 to 12 weeks of age. This parasite produces pathological changes in the liver and intestines, particularly in the ceca.

In the acute form of coccidiosis there is intense inflammation of the mucous membrane of the gut, with resulting bleeding, causing the droppings to become blood tinged, an important diagnostic evidence. The liver shows numerous small whitish, necrotic foci.

In the chronic form the contents of the ceca become hardened and cross section shows a concentrically arranged mass of fecal material, necrotic exudate and blood. Chickens quickly emaciate and become weak and anemic.

An important preventive measure recently developed is the confinement of chicks to houses and small runs that use hardware cloth stretched a few inches above the permanent floor to prevent the birds from consuming infective droppings. Frequent change of lots to clean ground is helpful in controlling the disease, which is carried over in the soil from season to season or in adult fowls that have had the disease and become carriers.

Various medicinal treatments have been tried. In our experience the most satisfactory of these consists of quinin sulphate and beta-naphthol administered on alternate days in one-quarter grain dosage to chicks 6 to 8 weeks of age. The treatment is continued for eight days. Checked experiments have shown its value.

Dr. John Patterson of Hedrick, Iowa, reports the use of this treatment in the field on more than 10,000 birds in two years with almost 100% success.

The diet of affected birds has an important influence upon the outcome of the disease. Heavy feeding of milk in some form is recommended, either liquid milk as the sole source of drink or powdered milk to constitute 30% of the ration. Beach of California was the first to recommend milk treatment and bases his advice upon observation of large numbers of chicks so treated. Milk, in addition to being the best source of protein feed for chicks, creates an acid condition of the intestines unfavorable to the development of coccidia.

Importance of Diet in Prevention and Treatment of Disease

Measures directed toward the treatment or prevention of any infectious disease of poultry should be supplemented by regulation of the diet. The success of the former is often largely dependent upon the latter. Correction of an improper diet; addition of supplemental feeds, particularly milk in some form, to diets low in protein; reduction of the protein content of a forcing diet, or substitution of milk for the tankage or meat meal being used, or even a change from one good diet to another, are all to be considered when treatment is instituted. Quite often this alone will be followed by rapid and noticeable improvement.

If drugs are used at the same time it is quite natural that they will receive credit from the poultryman for any improvement of the condition. There is no reason why the veterinarian should discourage him in such belief, for it is highly probable he could not be persuaded to adopt the suggestions regarding diet, without at the same time being advised to use drugs.

INFECTED MILK CAUSES EPIDEMIC

The first milk-borne epidemic of the year in Illinois was reported from Ottawa about the middle of June. It was a limited outbreak of scarlet fever which was confined largely to South Ottawa. Nearly all of the cases were exposed to infection through milk taken from the same dairy. Health officers found a case of scarlet fever on the premises of the dairy, which was promptly quarantined as soon as the discovery was made. About a dozen cases were involved.

During the summer of 1928 two outbreaks of milk-borne scarlet fever occurred in Illinois. One of these was at Grant Park and the other at Edwardsville.—*Illinois Health Messenger.*

No workable system of dairy sanitation, however good, can eliminate occasional milk-borne infections. Proper pasteurization is the only wholly dependable preventive of such epidemics.

ADVICE TO YOUNG PRACTITIONERS

The first years of practice are the years which determine irrevocably what manner of physician you are to be. The great men of our profession are the men who have never ceased to be students. During the years when you are finding yourself in your chosen community, before the demands of your practice engross you fully, you may, and by all means should, acquire the habit of self-directed study. Professional magazines, good books, should be studied as diligently and conscientiously as you ever studied your anatomy, physiology or surgery. Make every case a text for study. Set aside a part of each day for serious study. Present the results of your studies to your fellow physicians in the county medical society. Let it be made a monthly post-graduate course, where ideas may be presented and exchanged. Clinical cases presented and discussed in a "habitually friendly" manner will furnish material for many profitable meetings. One case well studied is more profitable than ten cases observed but casually.—Albright, G. C.: The County Medical Society, *J. Iowa M. Soc.*

COCCIDIOSIS IN RABBITS

COCCIDIOSIS is a widely spread malady affecting rabbits under ordinary domestic conditions. Observations on 365 rabbit specimens received at the Denver laboratory to date indicate that coccidiosis exceeds any other trouble noted in these animals.

Symptoms

Young rabbits between 5 and 8 weeks old appear to be more susceptible to coccidiosis than older ones, although exceptional cases are sometimes noted. Loss of appetite, exhaustive diarrhea, weakness, running eyes, pot bellies, roughened coat, and a mucous discharge from the nostrils are the symptoms usually observed in afflicted animals. Death generally follows shortly after the symptoms are pronounced.

Control or Preventive Measures

Absolute cleanliness and daily removal of the droppings are essential in controlling this trouble. This may be facilitated by using self-cleaning hutches or those having removable bottoms or trays. Hay and other roughage should be fed in racks protected from soiling by urine or feces. Drinking vessels and feed dishes must be kept clean and sanitary. Infected hutches may be cleaned by scrubbing with a strong, hot solution of lye, or one part creosol in fifty parts of water, followed by rinsing with hot, clean water to remove disinfectant. A small quantity of lime is useful to sweeten the hutches. If strong sprays or other germicidal substances are left on the litter or in the hutches, danger may follow by the animal ingesting such injurious substances. The writer believes that hutches should be provided with a generous amount of litter, straw being preferable.

Autopsy Findings

Post mortem examinations of rabbits

dead of coccidiosis usually show one of two conditions:

1. In older animals, the tissues may be emaciated and watery in appearance. In these cases the liver is the outstanding organ showing disease, evident by few or numerous, whitish-gray areas throughout the liver substance; other organs and viscera are usually normal.

2. Young rabbits showing normal pink, healthy lungs, with the large intestine distended and containing brownish-colored contents, usually means coccidiosis. The microscope in either the liver or intestinal case tells the story of coccidial infestation.

Differential Diagnosis

Some of the symptoms noted in coccidiosis may likewise be present in other afflictions of rabbits. Hemorrhagic septicemia, a bacterial disease similar to cholera in poultry, is highly fatal to these animals, and is often encountered in domestic rabbit raising. This disease can be diagnosed by a competent bacteriologist, and proper vaccination usually prevents further losses.

Snuffles of a chronic character is due to one or more organisms and may exist wholly independent of coccidiosis. Vaccination with a bacterin, made from such diseased animals, has given favorable results when used over a period of time, and particularly as a preventive inoculation. The writer has observed slobbers in some cases of coccidiosis.—Geo. W. Styles in *Small Stock Magazine.*

BLACK TONGUE—CANINE TYPHUS*

BLACK tongue, typhus or Stuttgart disease in dogs was recognized in Europe as a distinct disease as long as 75 years ago, but it was not until the very severe outbreak in 1898-99 and 1900 that it attracted general attention. Because of its great prevalence near Stuttgart, Germany, in the beginning of the outbreak, the disease is quite generally called Stuttgart disease in Europe.

For at least 50 years, a disease has occurred among dogs in the Southern states that is very similar if not identical with the European disease. Here it is called black tongue or canine typhus.

It was not until a decade after the widespread outbreak in Europe that this disease began to appear with any frequency in the northern cities of the United States. During the decade from 1910 to 1920 this disease gradually extended to cities in all parts of the country and is now fairly common over pretty much the whole country.

The cause of black tongue or canine typhus is unknown. The means by which it is spread have never been discovered. In its sudden widespread outbreak in Europe

* One of a series of popular articles published in 1926 on diseases of dogs. Although written for lay readers it is reproduced here for such suggestions as it may contain for veterinarians who desire to instruct their clients in the care of their dogs.

The Whippet Derby

30 years ago, and in its fairly rapid extension over the United States, it has shown characteristics of an infectious disease. On the other hand, in its attack on individual dogs, it does not appear to be contagious. Rarely indeed and then apparently only as a coincidence does it attack more than one dog at a time in a kennel. The most intimate exposure to a sick dog fails to cause the disease. Investigators have been unable to communicate the disease from one dog to another. It is generally believed by veterinarians to be a dietary disease, and its occurrence is attributed to a lack of meat in the diet; in fact it has long been known as "corn bread disease" in parts of the South because it occurred in dogs fed largely or exclusively on corn bread.

The lesions of canine typhus are primarily and in most cases exclusively confined to the alimentary tract; that is, to the digestive system, with the earliest and most marked symptoms occurring in the mouth. It occurs in mature to old dogs. Dogs less than two years of age are rarely attacked. In this it is unlike other diseases of dietary origin, which are commonest in young dogs. Dogs six to ten years of age and even older are the commonest victims. The morality is very high in old dogs; young dogs two to five years old, more frequently recover. Some research work has recently indicated that the addition of brewer's yeast to the feed of dogs will prevent black tongue. This is based on the theory that it is canine pellagra, due to the same cause (a vitamin deficiency) that results in pellagra in man and preventable by the same measures.

The disease begins with a sudden and complete loss of appetite. There is at first constipation, soon followed by a bloody diarrhea, the discharges being extremely foul smelling. There is persistent vomiting, great tenderness of the abdomen, and extreme prostration. The loss of flesh is very rapid; so rapid that the change is quite noticeable from day to day.

The mouth is always involved. It may be a livid red with large eroded areas on the gums and on the inner surface of the cheeks and under side of the tongue, and have an extremely offensive smell. In other cases, an inflammation extending deeper into the tissues, becomes hemorrhagic and dark colored, sloughs occur at the corners of the mouth; the tongue becomes purplish, brown or even black (hence the common name) and may shrivel up at the end. If the tongue has not turned black before death, it usually becomes black very soon afterward.

The owner of the dog is apt to confuse an attack of typhus with food poisoning, or with the intestinal form of distemper. But the sudden onset, the stubborn vomiting, the great prostration, the extremely rapid loss of flesh, the age (distemper seldom attacks dogs that are more than a year old) and the extraordinarily offensive odor of the breath, the mouth and the feces, should identify it for what it is, next to rabies the most fatal widespread disease of mature dogs.

Death usually occurs about the sixth day of the disease, rarely as early as the second day. Cases that last for ten days commonly recover. The convalescence requires two to three weeks in young dogs to four or five weeks in aged animals.

Canine typhus is too serious a disease for the dog owner to treat with any hope of a successful outcome. Such cases require careful feeding, the best of nursing, regular and well balanced stimulation, washing the stomach, washing the bowels, agents to relieve the pain and suffering and the subcutaneous or intraperitoneal injection of normal salt solution to replace the liquids lost in the diarrhea and repeated vomiting, together with such special treatment as the individual case may require. These measures call for the services of a veterinarian.

NOTE: Since the foregoing was written the researches of Goldberger and associates in the U. S. Public Health Service offer what seems to be conclusive evidence that black tongue in dogs is due to the same thing that causes pellagra in the human—a vitamin deficiency in the food. The vitamin necessary to the prevention of the disease occurs

plentifully in meat, fish, and brewer's yeast, and to a less extent in some other foods.

FRIGHT DISEASE IN DOGS*

RUNNING fits, fright disease and epizootic hysteria are descriptive terms applied to a variety of ailments in the dog.

The characteristic symptom which earns any of the foregoing names for an ailment, is great and uncontrollable excitement, manifested usually by running violently in a circle or in various directions, howling, actually screaming as if in great pain; running into all manner of objects as if blind, endeavoring to climb upon articles of furniture or other objects, or even up a wall or upon animals.

In other cases, there is continuous, piteous howling and convulsive movements which cause the animal to fall and struggle unsuccessfully to rise, foam at the mouth and finally lie for from a few minutes to several hours in a semi-conscious condition.

The running fit is commonly of short duration, passing within five minutes, and the animal is apparently normal until the next attack. Attacks may occur several times a day or only at long intervals. Hunting dogs are the more subject to the running attacks and house dogs to the severer convulsions, but either variety may occur in any breed or kind of dog.

Epizootic hysteria as some veterinarians call it, or fright disease as most dog owners call it, is generally regarded as a new disease. It was only about eight years ago that it began to attract attention in the Southern states and only half as long ago when it became common in the large cities at the North.

When any disease suddenly attracts wide attention all conditions anywhere near resembling it are blamed upon it. Such has been the case with fright disease. All nervous storms in the dog were immediately called fright disease by many dog owners. Thus cases of convulsions (fits) due to distemper, worms, cerebritis, eclampsia and particularly due to indigestion—ailments that have always affected dogs, are looked upon by many dog owners as true cases of fright disease or running fits.

As to whether there is a nervous disease of dogs independent of the diseases heretofore recognized, there is yet some question. If fright actually exists separate and distinct from the other diseases causing nervous symptoms, its cause is unknown. It usually or at least frequently accompanies some sort of intestinal irritation and almost as commonly a diet deficient in meat. There is considerable evidence that it is a deficiency disease—a dietary ailment.

In dogs having repeated attacks it is noted the attacks are prone to occur at times of excitement. In hunting dogs, while on a a hunt; in house dogs when teased or alarmed by strangers; in certain individuals when taken for a ride in an automobile; in mother dogs at the time of suckling; in performing dogs just after going off the stage, etc. On the other hand, attacks sometimes occur when no plausible cause can be assigned.

The attacks are not fatal, at least ordinarily not until they have recurred many times. They are so alarming, however, that the owner of the dogs usually seeks immediate aid, and this is proper. The attack appears to cause great suffering in the animal, and the severer forms are followed by great prostration.

Every attempt should be made to shield the affected animal from excitement. It should be provided a good, easily digested diet, which for a dog means largely a meat diet. A veterinarian should be consulted to ascertain if the attack be really the somewhat indefinite ailment under discussion or if it be due to worms, indigestion, distemper or other recognized causes of convulsions. If it belong to the latter group, appropriate treatment for the particular ailment, of course, is called for.

* One of a series of popular articles published in 1926 on diseases of dogs. Although written for lay readers it is reproduced here for such suggestions as it may contain for veterinarians who desire to instruct their clients in the care of their dogs.

The Eastern State Conference a Success*

The Eastern States Tuberculosis Conference was held in the Municipal Auditorium, Dr. E. A. Crossman presiding at the opening session.

The Conference was welcomed by the Honorable Fordis C. Parker, Mayor of Springfield, and the response was by the Honorable Berne A. Pyrke, Commissioner, Department of Agriculture, Albany, N. Y.

The first day was given over largely to the customary reports of the various state officials and naturally did not differ much from the routine of previous meetings held in the East and elsewhere, with the exception that three dairymen, actually engaged in the production of dairy products, gave their experiences in ridding their herds of tuberculosis. They did so in a plain, courteous and impressive manner. It was evident that notwithstanding each of them had lost most of his original herd, they all believed they had benefited by the procedure. If the experiences and testimonials of such men could reach every corner where dairying is an important industry, it would do much to clear away the mist of skepticism. The thing which each of these men dwelt on, and which is of such importance to the man with little or no capital, is the delay in receiving their indemnity for the animals destroyed. Everyone who has had experience in large affairs and particularly those of the state or government naturally knows how cumbersome details are but it is not generally known that officials must be careful to carry out many, many details, while in themselves of but little import, still they are the safeguards against either dishonesty on the one hand or unjust criticism by the public on the other. However, in this particular matter where capital is so vital, entering into the very maintenance and life of some farmers' families, red tape should be shorn at every possible place.

There was a splendid program of papers presented, but we all realize, let the headings or captions be what they may, there is no great amount of new information gathered weekly, monthly or even yearly on tuberculosis control and eradication, as the whole subject has received such universal attention for the last quarter of a century. It is now but a question of keeping everyone on his toes and helping those new in the work.

Dr. E. A. Watson, Chief Pathologist, Animal Disease Research Institute, Canada, reviewed

*Report of the 10th Annual Eastern States Conference and Meeting of the Massachusetts Veterinary Association held at Springfield, Massachusetts, June 18, 19, and 20, 1929, by J. F. De Vine, Goshen, N. Y.

VETERINARIANS HOLD DELIGHTFUL PICNIC

The group shows about 200 veterinarians and their wives at the annual picnic of the Eastern Iowa Veterinary Association, Vinton, July 9, 1929. The structure in the background is the club house of the Vinton Country Club, where the picnic was held. The well balanced figure in the center is State Veterinarian Peter Malcolm umpiring the base ball game of the "Blonds and Brunettes." There was a men's base ball game also, and a golf tournament, but the game here shown created the most excitement. However, the most absorbing interest was shown in the picnic dinner that followed.